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SPECIAL CATALOGUE, No. I.

NESTS AND EGGS OF BIRDS

FOUND BREEDING

IN

AUSTRALIA AND TASMANIA,

BY

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INTRODUCTION.

THE present and first volume contains descriptions of the Nests and Eggs of one hundred and sixty-five species of Australian and Tasmanian Birds, and is chiefly based on the collections in the Australian Museum. The birds enumerated form portion of the Order PASSERES, and belong to the Families CORVIDÆ, PARADISIDÆ, PITHONORHYNCHIDÆ, ORIOLIDÆ, DICKCIRIDÆ, PRIONOPIDÆ, CAMPOPHAGIDÆ, MUSCICAPIDÆ, TURPIDÆ, SYLVIDÆ, and TIMIIDÆ.

By the loan of specimens, and the contribution of information, considerable assistance has been received from many valued correspondents whose names appear in the work. Amongst these, thanks are specially due to Messrs. G. A. Kearland, J. Gabriel, C. French, Junr., C. E. Cowle, Edwin Ashby, T. Carter, G. Savidge, E. H. Lane, F. Hislop, E. D. and R. N. Atkinson, and Drs. L. Holden, W. Macgillivray, A. M. Morgan, and Charles Ryan. I am also indebted to the Trustees and the Director (Dr. E. C. Stirling, F.R.S.), of the South Australian Museum, Adelaide, who have lent numerous specimens for comparison and examination, and to the Assistant Director (Mr. A. Zietz), who has at all times courteously supplied me with the available information relative to them. Acknowledgment must also be made of the loan of specimens from the Queensland Museum, through the Curator (Mr. C. W. De Vis, M.A.), and of access to the collection of the Macleay Museum, at the University of Sydney, and of information regarding the specimens given by the Curator (Mr. G. Masters).

Altogether one hundred and seventy-two species of Australian and Tasmanian birds are described in this Catalogue, of which the types of the following fourteen species are in the Australian Museum Collection:—*Corvus bennetti*, *Scenopæctes dentirostris*, *Elurardus maculosus*, *Rhipidura albicauda*, *Rhipidura intermedia*, *Heteromyias cinereifrons*, *Pacilodryas nana*, *Malurus assimilis*, *Amytis modesta*, *Eremiornis carteri*, *Acanthiza mastersi*, *Aphelocephala nigrifincta*, *Orthonyx spaldingi*, *Calamanthus albifloris*, and the co-type of *Ephthianura crocea*.

The figures of eggs, which are of the natural size, have been reproduced by the heliotype process at the Government Printing Office, from photographs of the originals, taken under the direction of the Government Printer, Mr. W. A. Gullick.

The original drawings of birds, from which the figures have been re-produced, were made by the late Mr. Neville Cayley, who also coloured the plates of eggs in the coloured copies. With four exceptions, the photographs of nests, etc., are the work of the Museum Photographer (Mr. H. Barnes, Junr.) and myself.

A. J. N.

SYDNEY, October, 1904.

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ORDER PASSERES.

Family CORVIDÆ

Sub-family CORVINÆ.

Genus CORVUS, *Linnaeus*.

Corvus coronoides.

HAZEL-EYED CROW.

Corvus coronoides, Vig. & Horsf. Trans. Linn. Soc., Vol. XV., p. 261 (1826); Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 20 (1877).

ADULT MALE—*General colour above and below black glossed with purple: outer webs of the primaries and of the external tail feathers slightly shaded with bronzy green; bases of the feathers on the upper parts snow white; bill and legs black; "iris brown"* (Elsey, Morton). *Total length 20 inches, wing 13½, tail 8½, bill 2½, tarsus 2.35.*

ADULT FEMALE—*Similar to the male in plumage, but slightly smaller.*

Distribution. Queensland, New South Wales, Victoria, South Australia, Western and North-western Australia, Northern Territory of South Australia, Central Australia, Tasmania.

THE Hazel-eyed Crow is widely distributed over the greater portion of the Australian continent and Tasmania, although it is by no means so plentiful as the Raven (*Corone australis*) which is often mistaken for the present species. In New South Wales, it frequents alike the mountain ranges near the coast, and the belts of timber bordering the rivers and creeks inland. In some seasons it is only met with in the coastal districts, in isolated pairs, but at all times it is more numerous in the autumn and winter. Generally it may be observed in the neighbourhood of slaughter-houses or killing-yards, and not infrequently on the low-lying lands near the mouths of tidal rivers, and on the sea-shore. As a rule, it is exceedingly wary and difficult to shoot.

The food of this species consists of insects of various kinds, principally locusts, crickets, and beetles, the flesh of any slaughtered animal, young birds and eggs, small mammals and reptiles, dead fish and crustaceans. About orchards it eats nearly every kind of cultivated fruit, and during the autumn and winter feasts upon grain. Pastoralists, as a rule, regard all members of the genera *Corvus* and *Corone* with disfavour: but the loss attributed to the depredations of the Crow during the lambing season is in reality caused almost wholly by its congener the Raven, a far warier and much commoner species, with which it frequently consorts.

The collection brought back from Central Australia by the Horn Scientific Expedition, in 1894, and which I had the pleasure of examining, contained several specimens of these birds. In his field notes, Mr. G. A. Keartland writes as follows:—"A camp-fire seems to possess an irresistible attraction for *Corvus coronoides*. No matter where the wanderer in Central Australia may decide to boil his "billy," he is sure to have a visit from one or more

of these Crows before the water boils. Once, at Heavitree Gap, a Crow seized a piece of meat from the table while the cook was at work. At Hermannsburg, over thirty of them were within gunshot at one time, waiting for the refuse from the birds I was skinning."

The following observations were also made by Mr. Kearland while he was a member of the Calvert Exploring Expedition in Western Australia in 1896-7:—"During the early part of our journey, the Hazel-eyed Crows (*Corvus coronoides*) were frequently observed, but as the hot weather set in, in October, they became scarce, and were afterwards found only in the vicinity of water, so that to us at least they ceased to be birds of evil omen. In December, and the first week of January they were very numerous around our camp near the junction of the Fitzroy and Margaret Rivers in North-west Australia, and united with the Kites (*Milvus affinis*) in performing the duty of scavengers. During the heat of the day they might be seen either perched or flying with their bills wide open, showing that they too suffered from the scorching sun." Mr. Kearland also writes me:—"They drink frequently and are regarded as good water guides. I often saw them at the troughs and caught one in a Finch-trap baited with water. Just before the tropical rains fall they are at constant feud with the Channel-billed Cuckoo (*Seythrops nove-hollandic*). As soon as the rain came, the Crows all left, and were not seen again up to the time of our departure on the 10th March."

The nest of the Hazel-eyed Crow is a large open bowl-shaped structure, outwardly formed of sticks and twigs, and lined inside with bark, fibre, hair, fur, or wool, an average one measuring externally fifteen inches in diameter by seven inches and a half in depth, and the inner cavity six inches in diameter by four inches in depth. It is usually built in the upright forked leafy branches of a tree at a height varying from twenty to seventy feet from the ground. The bushy tops of the different species of *Eucalyptus*, *Frenela*, and *Melaleuca*, are generally resorted to as nesting-sites, and frequently several nests may be found in the same tree. The deserted nests of the Hazel-eyed Crow, like those of the Raven, and of many birds of prey, are frequently taken possession of by other species.

The eggs are usually from three to five in number for a sitting. In shape they vary from oval to elongate oval, some specimens being compressed towards the narrower ends; the shell, as a rule, is close-grained, and its surface smooth and slightly lustrous. The ground colour varies from very pale to bright green, and from pale ashy-blue to greenish-grey, which is freckled, spotted, or blotched with wood-brown, blackish-brown, or olive-brown, the markings as a rule predominating on the larger end, where a well defined zone or cap is sometimes formed. Some specimens have very fine indistinct scratches or smears of pale umber uniformly distributed over the shell; as a rule, however, the markings, whether large or small, bold or indistinct, are irregularly formed, but, in rare instances, examples may be found in which they consist entirely of rounded dots or spots. The eggs of the Hazel-eyed Crow, like those of the Raven, are subject to considerable variation in colour and the disposition of their markings, and the eggs of both birds are indistinguishable from each other. A set of four measures as follows:—Length (A) 1.71 × 1.23 inches; (B) 1.73 × 1.23 inches; (C) 1.74 × 1.25 inches; (D) 1.8 × 1.25 inches. Another set of four measures (A) 1.9 × 1.27 inches; (B) 1.88 × 1.3 inches; (C) 1.86 × 1.28 inches; (D) 1.85 × 1.25 inches.

Young birds may be distinguished by their duller and browner plumage, the wing and tail feathers being the last to acquire the rich gloss of the adult livery.

In Eastern Australia, the breeding season usually commences at the end of July or early in August, and continues until the middle of December.

* Trans. Roy. Soc. South Austr., Vol. xxii., p. 180 (1898).

Corvus bennetti.

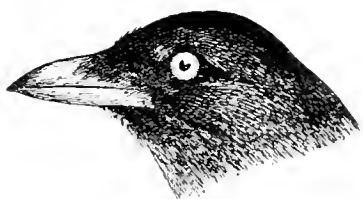
SMALL-BILLED CROW.

Corvus bennetti, North, Viet. Nat., Vol. XVII., p. 170 (1901).

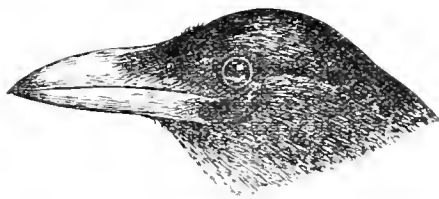
ADULT MALE—General colour above and below black glossed with purple; primaries and tail-feathers black, slightly washed with bronzy-green; bases of the feathers on the upper parts snow-white; bill and legs black; "iris white" (Bennett). Total length 16 inches, wing 12.3, tail 7.3, bill 1.85, tarsus 2.2.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Western New South Wales, Victoria, South Australia.



HEAD OF SMALL-BILLED CROW.



HEAD OF HAZEL-EYED CROW.

THERE are two very distinct species of the genus *Corvus*, inhabiting Australia. In the original description of *C. coronoides*, in the "Transactions of the Linnean Society of London," the measurements there given by Vigors and Horsfield are as follows: Total length 22 inches, wing 14, tail 9, bill 2.3, tarsus 2.3. The locality where it was obtained is not given, but as it formed part of a collection made by Mr. Caley in the early days of the settlement of the State, it was probably procured near Parramatta. Examples in the Museum collection from New South Wales, from Port Darwin, and from Wide Bay, and Fraser's Island, in Queensland, are about the same average measurement, and are easily distinguished from *C. bennetti* by their larger and more powerful bill, and stronger tarsi. The iris too in those birds from Port Darwin and Queensland was noted by their respective collectors, Mr. A. Morton, Mr. G. Masters, and Mr. J. A. Thorpe as being brown.

The specimens from which the description of the present species was taken, were all collected by my esteemed friend the late Mr. K. H. Bennett, to whom I am deeply indebted for information on this, and many other species, in August 1883, at Moolah, in the Western District of New South Wales, and I have much pleasure in associating specifically the name of one who, by his field work and observations, contributed so largely towards completing a knowledge of the Australian avifauna. *C. bennetti*, which is also found in Victoria and South Australia, may be distinguished principally by its much smaller and straighter bill, and more slender tarsi; also, by its smaller average measurements, and by having the iris pure white in the adults of both sexes. As a rule in closely allied species, or races, the smaller representative is usually found in the northern portion of the continent, but in the present instance this order is reversed.

The drawings above are taken from a photograph, to show the relative size of the bills of the two species.

Of the Small-billed Crow the late Mr. K. H. Bennett wrote as follows in his MS. notes:—"This species differs from *Corone australis* in its much smaller size, and in having the concealed portions of the body feathers white, instead of dusky or blackish; the note also is very different. Although sometimes found in company with the Raven, it is seldom seen on the

plains, its principal habitat in this portion of the colony being a strip of lightly timbered land, some few miles in width, situated between the plains and the densely timbered scrubby back country. In this belt the Leopard-tree^{*} is found, in which almost exclusively the nests of this species are placed. It is a tree of moderate height, averaging from thirty to forty feet, but has extremely long, slender, and naked branches, terminating in a thick bunch of twigs and leaves, and in the topmost portion of it the nest is constructed.

"This species is by far less numerous than *Corone australis*, and unlike that bird it is not gregarious, being generally seen in pairs, and seldom in companies of more than four or five individuals. It is not mischievous or destructive, its food consisting chiefly of insects and small reptiles, to which are added seeds and berries. The note of this bird is represented by the word 'car' repeated six or eight times in succession, and in a very shrill high key.

"The nest is similar to that of *Corone australis*, but smaller and more neatly made: it is an open bowl-shaped structure, outwardly formed of sticks, and lined inside with bark fibre, wool, fur, &c. It averages externally twelve inches in diameter by a depth of nine inches, and internally seven inches across by three inches and a half in depth. The eggs vary from three to five in number for a sitting, and they are usually deposited during the months of September and October. I have never handled the nestlings, so am unable to give the colour of the iris, but in the adults of both sexes they are white."

Regarding this species Mr. G. A. Kearland writes me as follows: "The small white-eyed Crows pay occasional summer visits to Victoria, but when they arrive it is in flocks of many hundreds. They either follow the myriads of grasshoppers from north to south, or time their visit to feed upon a species of ground-burrowing beetle. During one season they were unusually numerous on the plains at Little River, feasting on these beetles as they emerged from their burrows in the ground. I fired, killing four, and on picking them up was struck with their small size. On turning back the feathers of the head and neck, I observed that the basal portion of them was pure white; so, too, was the iris. On mentioning the matter to my brother-in-law, who had a small station at Hedi, he said that the Crows were regarded with great favour by the graziers and farmers in the neighbourhood, for although the birds were so numerous, they never interfered with the sheep, but seemed to live entirely on insect diet."

Of a set of four eggs taken by Mr. Bennett on 1st September, 1884, at Ivanhoe, three are elongate and compressed ovals, and the other oval and much smaller: the shell of all being close-grained and its surface lustrous. The ground colour is of a pale greenish-grey which is almost uniformly marked in the larger specimens with numerous very fine and almost obsolete scratches of bright umber; the markings on the smaller specimen are intermingled on the larger end with dots, spots, and small blotches of olive-brown. Length (A) 1.75 × 1 inches; (B) 1.65 × 1.02 inches; (C) 1.72 × 1.02 inches; (D) 1.45 × 1.02 inch. A set of three, taken by Mr. Bennett at Mossgiel in November, 1886, is somewhat similarly marked, but they are oval in form and not so lustrous.

Immature birds have the iris brown.

^{*} *Flindersia maculosa*, F. v. M.

Genus CORONE, *Kaup.***Corone australis.**

AUSTRALIAN RAVEN.

Corvus coronoides, Gould, Bds. Austr., fol., Vol. IV., pl. 18 (1818).

Corvus australis, Gould, Handbk. Bds. Austr., Vol. I., p. 475 (1865)

Corone australis, Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 37 (1877).

ADULT MALE—*General colour above and below black, glossed with purple: feathers of the throat lanceolate in form and tinged with green: bases of the feathers on the upper parts dusky-grey: bill and legs, black: iris, white. Total length in the flesh, 20 inches: wing 14½, tail 8½, bill 2½, tarsus 2.55.*

ADULT FEMALE—*Similar to the male in plumage, but slightly smaller, the lanceolate feathers on the throat not so well developed.*

Distribution—Queensland, New South Wales, Victoria, South Australia, Western and North-western Australia, Northern Territory of South Australia, Central Australia, Tasmania.

THE Raven may be distinguished by the long lanceolate feathers on the throat, and the dusky bases of the body feathers. Although generally distributed in suitable situations over the greater portion of Australia and Tasmania, they evince a decided preference for the large inland open plains of the States, and are seldom met with in thickly timbered country. They are by far the most common birds inhabiting the plains between the Lachlan and Darling Rivers, in the Central District of New South Wales, and they are equally abundant in the open expanses in the western and north-western portions of the State. Frequently they are seen in company with *Corvus coronoides*. During winter they are gregarious, and in the daytime are associated in large flocks, scattered over the plains. Just about dusk they may be observed flying swiftly a few feet above the ground to their roosting-places in some thick clump of trees on the plain. While winging their way they keep up a subdued cawing, which becomes very much louder after reaching their destination, and is continued for some time after dark, when it suddenly ceases. These birds are extremely wary, and it is difficult to get within shooting range of them unless they can be approached under cover, which is rarely the case, or advantage is taken of visiting their roosting-place at night. Poisoned baits, too, must be carefully laid for the Raven to take them. Although generally shy and cunning, these birds are inclined to be inquisitive if an unusual noise is heard, especially notes of alarm uttered by other species, or if there is a chance of a meal. At Enfield, one day, I found a nest of the Yellow-tufted Honey-eater, in a sapling scrub, containing two nearly fledged young. The parents were very excited and their cries brought about a dozen angry and noisy birds within a few feet of me. A Raven within half-a-minute suddenly dashed in on the scene, but on discovering me in the undergrowth, beat a hasty retreat.

The note of this species, which is usually uttered during flight is a loud and deep "gwar—gwar—gwar-r," varied occasionally with a shrill and high-sounding "korr—korr."

It is an omnivorous species, but has a partiality for the flesh of any animal more than other foods, and it is frequently found in the neighbourhood of slaughter-houses, and killing-yards performing with efficiency the duties of a general offal scavenger. It also feasts upon small mammals, birds, and birds' eggs, lizards, frogs, different kinds of insects and small crustaceans and other food picked up among the *débris* of tidal rivers. It destroys large numbers of locusts and other injurious insects and assists in keeping the balance of nature, but, making full allowance for this good quality, it is undoubtedly the worst bird pest we have in Australia.

Pastoralists suffer to a considerable extent from the ravages of this bird, for it is exceedingly destructive in the lambing season, picking out the eyes or killing lambs, even while the mothers

make vain attempts to protect them. A favorite method of attack is to seize the tail of the lamb with its powerful bill, and, spreading its wings, be dragged about by the doomed animal until with sheer exhaustion, it falls an easy prey to its relentless captor. They also attack weak sheep, especially during periods of severe drought, when they are in poor condition, and consequently less able to withstand the attacks of their sable-plumaged foes. Blindness and a lingering death is the inevitable fate of many that are not strong enough to rise. In wet seasons sheep frequently accumulate a large mass of earth and grass on one or more of their legs, until they are unable to walk about, and this is another harvest for the Ravens. Baggied animals are also easy prey for these birds. Near the bank of the Clarence River I saw about a dozen Ravens buffeting with their wings a newly-born calf that had managed to get down the steep bank, and was standing in the shallow water. This would have shared the ordinary fate only that my youthful companions succeeded in getting it out, and restoring it to the mother on the level ground above the banks. Frequently only the eyes of the animals attacked are picked out, and the tongue eaten. Reports of the depredations committed by these birds are common in the newspapers during the lambing season. On a large sheep station in western New South Wales, even with careful watching, it is estimated that the annual loss incurred by the destructive habits of these birds, varies from £200 to £400 per annum, according to the season. Rewards for "Crows" heads are offered by many Stock Boards throughout the States, but there is no apparent diminution in their numbers. All species of the genera *Corvus* and *Corone* inhabiting Australia are termed "Crows" by the Stock Boards, but the Raven is the real culprit. Sixpence per head was paid in the Moree and Narrabri District in 1898 for "Crows," but altogether bonuses were only paid on 844 birds. I found, however, that a large number of ground-frequenting birds had been destroyed by eating the poisoned baits laid for the Ravens.

In the Official report for the year 1899 of the Stock and Brands Branch of the Department of Mines and Agriculture of New South Wales, it is stated that during that year the Pastures and Stock Protection Boards throughout the colony paid a bonus from a 1d. to 6d. each on 142,147 "Crows," Wagga Wagga District heading the list with a total of 24,079 birds destroyed.

Next to the pastoralist, the vigneron and orchardist suffer most from the depredations of these birds, which eat grapes and nearly every kind of cultivated fruit. In some seasons more than others, about February or March, large flocks of Ravens, descend into the vineyards in the southern part of New South Wales, and commit great havoc, for they have voracious appetites, and both eat and destroy large quantities of grapes. Probably they are more numerous and do more damage in this part of the State, owing to the proximity of the large adjacent plains, the common resort of this species. In orchards they frequently feast upon peaches, plums, and mulberries, and other soft fruits, and even oranges and mandarins. Large flocks of them also do considerable damage in newly planted grain fields.

Many eggs and young birds are destroyed by Ravens, especially those which are placed in exposed or unprotected situations. They do not destroy the eggs or young of the smaller birds only, but plunder the nests of many of the larger species, particularly of waterfowl, and even combine in cunning to drive the Bustard (*Eupodotis australis*), and Native Companion (*Grus australasianus*), off their eggs. Where birds are subject at all times to the predatory attacks of Ravens, some have developed an instinct in safeguarding their eggs from this crafty oppressor. On Yandembah Station, the late Mr. K. H. Bennett, found a nest of the Black-backed Magpie (*Gymnorhina tibicen*), on the 16th August, 1889, containing a single egg. On climbing to the nest four days after he was surprised to find the egg missing, but noticing that the bottom of the nest presented a more uneven appearance, on making a further examination he found three eggs completely covered with a thick layer of wool and rabbit fur. During the same year he also found two sets of the eggs of the Australian Dotterel (*Eudromias australis*),

* Rept. Stock and Brands Branch, Dept. Mines and Agric. N.S.W., Appendix K., p. 31 (1900).

that were in each instance completely covered with a layer of thin sticks, from two to three inches in length. The Pink-eared Duck (*Malacorhynchus membranaceus*), also, when breeding in hollow limbs of trees, plucks only a little down from its breast to intermingle with its eggs. Frequently, however, it takes possession of the disused nest of another waterfowl which is built in an exposed situation, when it completely envelops its eggs in another nest placed on top, and formed entirely of down. Poultry-keepers in the country, whose stock has the run of the bush, dislike the Raven, for it carries off young chickens, and will venture close to out-buildings to steal eggs.

For the purposes of breeding the Raven readily adapts itself to its environment, resorting equally to the tall *Eucalypti*, especially when in the neighbourhood of cities, as to low trees in unfrequented situations. Inland these birds build their nests in companies in the low timber dotted about the plains, or in Pine ridges. A favourite site is in the crown of a Pine (*Freycinetia* sp.), but they are sometimes constructed in low Hop bushes (*Dodonaea lobulata*, F.v.M.), or in the top of a Salt-bush (*Atriplex* sp.) within a few feet of the ground. Near the coast, in Victoria, they are frequently built in low gum or tea-trees. About the outlying suburbs of Sydney, the nests of this species are not common and are usually built in the topmost branches of a *Eucalyptus* or *Angophora* at a height varying from fifty to one hundred feet from the ground. The nest, which is generally built in an upright fork, is a large bowl-shaped structure, the foundation being formed of thick sticks interlaced together, the walls of it being built of slightly finer material, and thickly lined inside with bark fibre, wool, fur, or hair. An average nest measures externally seventeen inches in diameter by ten and a half inches in depth, and the bowl-like cavity eight inches and a half in diameter by four inches in depth. The eggs are four or five, and occasionally six in number for a sitting. In shape they vary from elongate oval to rounded oval, some specimens being considerably lengthened and pointed at the smaller end, the shell being close-grained and its surface smooth and as a rule slightly lustrous. The ground colour varies from dark pea-green and dull greenish-grey to a light bluish-green and pale bluish white. Typically the ground colour is of a light shade of green, which is blotched, spotted, and freckled with blackish-brown, wood-brown, or light umber, the markings being larger on the thicker end. Others have very fine streaks and scratches of wood-brown or olive-brown, uniformly distributed over the shell, and in some instances a dark cap of the same colour, on the larger end. Some specimens are entirely blotched, or spotted uniformly all over the surface of the shell; others have very fine indistinct fleecy streaks or scratches, or have the smaller end devoid of markings, and the larger end finely dusted or peppered with different shades of brown. An unusual variety has a very pale bluish-white ground colour, and a cluster of well defined rich umber-brown markings on the larger end. Occasionally eggs are found of a uniform colour, and entirely free from markings. A set of four taken at Yandembah, on the 16th September, 1890, measures as follows: (A), 2.03×1.27 inches; (B), 1.85×1.27 inches; (C), 1.91×1.28 inches; (D), 1.81×1.28 inches. A set of five taken by Mr. George Savidge on the 18th September, 1897, at Copmanhurst, on the Clarence River, measure length (A), 1.64×1.18 inches; (B), 1.65×1.18 inches; (C), 1.62×1.16 inches; (D), 1.69×1.18 inches; (E), 1.6×1.2 inches.

Occasionally this species constructs its nest upon the ground, but one of the most curious sites I have known a bird to select for a nesting place was found by the late Mr. K. H. Bennett. On Yandembah Station, in the Lachlan District, where *Corone australis* is exceedingly numerous, he found one of their nests containing young ones on the 18th October, 1890, placed inside the skeleton of a sheep, lying on the open plain. The situation was rendered the more peculiar from the fact that there were numbers of trees, in which these birds used to build, less than a quarter of a mile away. During the previous season another pair constructed their nest in the drum of a whim close to the homestead, and from which Mr. Bennett took four eggs. On two occasions in 1889-90, on Yandembah Station, he also found the mud nests of the White-winged Cough, with eggs, constructed inside the deserted nests of the Raven, and has also taken from similar abandoned tenements, the eggs of the Nankeen Kestrel and Black Duck.

Nestlings are duller in colour than the adults, and have the base of the lower mandible, skin around the gape, and the inside of the throat deep rose-pink; iris very pale blue. Young birds have the bases of the feathers on the upper parts dusky brown, the purplish gloss to the feathers first appearing on the wings, back, upper tail-coverts and tail; iris very light brown.

Albinos of this species are not uncommon. The Museum collection contains also a specimen in very pale brown plumage, and having all the feathers on the upper parts broadly tipped with white.

August, and the four following months, constitute the usual breeding season in Eastern Australia, but nests containing fresh eggs have been found in New South Wales early in July, and as late as the middle of January. Young birds leave the nest when about a month old.

The nest figured on plate A1 was taken at Belmore, about eight miles from Sydney, on the 2nd September, 1898, and was placed in the topmost forked branch of a *Eucalyptus*, at a height of fully eighty feet from the ground. Externally it measures sixteen inches in diameter, by a depth of eleven inches, and internally eight inches in diameter by a depth of four inches.

Genus *STREPERA*, Lesson.

Strepera graculina.

PIED CROW-SHRIKE.

Corvus graculinus, White, Vcy. N.S.W., pl. opp. p. 251 (1790).

Strepera graculina, Gould, Bds. Austr., fol., Vol. II., pl. 42 (1848); id., Handbk. Bds. Austr., Vol. I., p. 168 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 57 (1877).

Strepera crissalis, Gould, MS., Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 57, pl. XII. (1877).



PIED CROW-SHRIKE

ADULT MALE—*General colour black, slightly glossy on the upper parts; bases of the primaries white; basal portion and tips of the tail feathers and the under tail-coverts, white; bill and feet black; iris yellow. Total length in the flesh 19 inches, wing 10.3, tail 8, bill 2.4, tarsus 2.1.*

ADULT FEMALE—*Similar in plumage to the male, but slightly smaller.*

Distribution.—Queensland, New South Wales, Victoria, Lord Howe Island.

THE Pied Crow Shrike or "Black Magpie" as it is more commonly called, is dispersed throughout the coastal districts and contiguous mountain ranges of the greater portion of Eastern Australia, and is also found on Lord Howe Island. In New South Wales it is abundantly distributed over the Dividing Range, and although it occurs in the open forest-lands beyond its western slopes, I have never met with it far inland, or in the clumps of belts of timber growing on the plains. In the autumn I have observed it near Sydney in

small flocks about Canterbury and Belmore, also about the highlands on the Milson's Point railway-line. On the Blue Mountains, and in the South Coast districts, it is exceedingly numerous in June, July, and August, moving about in large flocks, numbering from fifty to several hundred individuals.

The adult birds of this species vary in size, even, sometimes, when shot out of the same flock, the males, which are larger, varying in wing-measurement from 9·7 to 10·4 inches, and the females from 9 to 9·4 inches; the same variations exist in the length and breadth of the bill; some I have seen with the upper mandible longer and slightly hooked at the tip.

Specimens from Lord Howe Island, obtained by Messrs. Etheridge and party in 1887, and by Mr. E. H. Saunders in the same year, are similar to Australian examples. Among those procured by Mr. Saunders on Lord Howe Island is one with the basal portion of the tail feathers and the under tail-coverts, of a pale fawn-rufous; another has only one side of the basal half, and the tips of the tail feathers, of this colour. The accidental staining of these parts, Mr. Etheridge informs me, is due to the red volcanic soil of the island. Gould's MS. name of *crissalis*, which Dr. Sharpe has adopted for a similar specimen from Lord Howe Island, described and figured by him in the "Catalogue of Birds in the British Museum," therefore ranks only as a synonym of *S. graculina*.

The peculiar note of the Pied Crow-Shrike is generally uttered while flying, and the united cries of a large flock of these birds when on the wing, can be heard a considerable distance away.

Its natural food consists of wild fruits, berries, and seeds; also, insects and their larvæ. For the latter I have seen them diligently searching ploughed lands and cultivation paddocks, and tearing off with their powerful bills the bark of trees to obtain the insects lurking underneath. The presence of a flock of these birds, while so engaged in dead timber, has often been indicated by the noise made as they jumped on the dead twigs and snapped them off, or by an occasional low, mournful, whistling note. As settlement proceeds, however, and the scrubs and brushes from which they obtain their food are gradually being cleared, these birds freely enter orchards, gardens, and cultivated lands, and commit great depredations among the fruit and cereals.

Mr. J. A. Boyd informs me that at Eden, New South Wales, this species frequently steals the eggs from his poultry-yard. One he caught in the act was inside a meshed wire fowl-run, when he espied the bird with an egg in its claws. This it flew away with out of the enclosure, but dropped it just prior to Mr. Boyd shooting the feathered pilferer.

With a specimen of this bird sent for identification, Mr. J. D. Lankester, of Albury, writes under date of 10th July, 1895: "This species, known here as the 'Mutton bird,' has been more numerous and destructive than usual. They have attacked the grapes on the vines, and are very persistent when the raisins are on the trays drying. Since then they have destroyed the quinces, and are now eating the olives. Shooting does not frighten them away." During the winter months these birds, when hard pushed for food, are omnivorous, for in July, 1896, Mr. A. E. Hays and a friend saw at Stony Batter near Uralla, several of them in a killing-yard, feeding on offal. The stomachs of specimens examined by me during the same month contained skins of wild fruits, berries, and maize, and the heads, legs, and elytra of beetles.

The Hon. James Norton, LL.D., M.L.C., who has had considerable experience with these birds at his country residence at Springwood, on the Blue Mountains, writes: "The food of *Strepera graculina*, consists naturally of berries and fruits. It makes its appearance in summer, often in great flocks, and deals destruction to every kind of cultivated fruit, except the orange tribe and passion fruit. Apples, pears, peaches, and quinces are easily chopped to pieces by its powerful bill. The softer fruits, such as figs, are devoured in a few bites, and grapes are

* Dept. of Agriculture, N.S.W., Bull. No. 1, App., p. 247 (1890).

swallowed wholesale. Before the maize grains begin to harden, this incorrigible thief, with its strong claws and powerful mandibles, strips back the tough sheathing of the cob, and often leaves not one solitary grain. If driven off it soon sneaks quietly back in the most impudent manner, though, after a little shooting, it becomes so wary that it is difficult to get a shot. It would be a good thing if this pest could be eradicated, for it would be possible to keep it down in any particular district if the gardeners therein would cordially combine for the purpose. I have been told that this bird will eat flesh, and that numbers are sometimes destroyed by poisoning a bullock's head and placing it in a tree out of the reach of dogs. It strikes me that it might be easily taken in a wire fish-trap baited with fruit, for it trees are netted, and a small opening accidentally left, it will force itself through, which it is unable to find quickly when disturbed, and by this means I had the satisfaction during the last fruit season of beating several of the marauders to death. Twine nets, unless too heavy for convenient use, are not of sufficient protection, for on several occasions the birds have torn their way through them in order to get at the protected fruit."

The nest is a large open structure, rather roughly formed externally of sticks and twigs; the inside, which is neatly rounded and cup-shaped, being lined usually with fibrous roots, at other times with coarse dried grasses, or fibrous strips of bark. An average nest measures externally fourteen inches in diameter by five inches and a half in depth; the inner cup seven inches in diameter by three inches in depth. It is usually built in an upright or leaning fork of a Eucalyptus, at a height varying from twenty to sixty feet from the ground. Eggs three in number for a sitting, varying from oval to elongate oval, the shell being close grained, and its surface smooth, dull, and almost lustreless. In ground colour they vary from pale brown to pale vinous-brown, which is faintly freckled, blotched, or streaked with darker and different shades of the ground colour, the markings predominating as a rule on the thicker end, where in some specimens they are partially confluent and form an ill-defined cap or zone. A set of three, taken by Mr. George Savidge in the Cangai scrub, at the head-waters of the Clarence River, on the 16th October, 1868, measures as follows: (A) 1.55 x 1 inch; (B) 1.53 x 1.12 inch; (C) 1.52 x 1.11 inch. Another set of three measures: (A) 1.6 x 1.2 inch; (B) 1.62 x 1.11 inch; (C) 1.62 x 1.14 inch. Figure 12 on Plate B1 is from the former set.

Young birds resemble the adults, but are duller in colour on the upper parts, the secondaries and greater wing-coverts have narrow whitish tips, and the bases of the primary-coverts are dull white; all the feathers on the throat, breast, and abdomen are edged or tipped with brown.

September and the four following months constitute the usual breeding season of this species.

Mr. Savidge informs me that about Copmanhurst, on the Upper Clarence River, the Pied Crow-shrike has been observed feeding the young of the Channel-billed Cuckoo (*Scythrops nova-hollandie*). Mr. Savidge has also several times seen it chasing the latter species away.

Strepera arguta.

HILL CROW-SHRIKE.

Strepera arguta, Gould, Proc. Zool. Soc., 1846, p. 19; *id.*, Bds. Austr., fol. Vol. II., pl. 44 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 171 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 59 (1877).

ADULT MALE—*General colour blackish-brown, with darker margins to the feathers of the back, scapulars, rump, and upper tail-coverts, primaries black, the basal half of their inner webs white, and having narrow indistinct brownish-white tips; tail blackish-brown, all but the two central feathers broadly tipped with white; under tail-coverts white; bill and legs black; iris yellow. Total length 21 inches, wing 11.8, tail 10, bill 2.8, tarsus 2.8.*

ADULT FEMALE—*Similar in plumage to the male, but slightly smaller.*

Distribution.—Tasmania.

GOULD writes of this species:—"The *Strepera arguta* is abundantly dispersed over Tasmania, but is more numerous in the central parts of the island than in the districts adjacent to the coast: it also inhabits South Australia, in which country it is more scarce, and all the specimens I have seen are rather smaller in size. I have never seen it in any part of New South Wales that I have visited, neither have specimens occurred in the numerous collections from the west coast that have come under my notice. It is the largest, the boldest, and the most animated species of the genus yet discovered. If not strictly gregarious, it is often seen in small companies of from four to ten, and during the months of winter even a greater number are to be seen congregated together. The districts most suited to its habits are open glades in the forest and thinly timbered hills: although it readily perches on the trees, its natural resort is the ground, for which its form is admirably adapted, and over which it passes with amazing rapidity, either in a succession of leaps or by running. Fruits being but sparingly diffused over Australia, insects necessarily constitute almost its sole food, and of these nearly every order inhabiting the surface of the ground forms part of its diet: grasshoppers are devoured with great avidity.

"Its note is a loud, ringing, and very peculiar sound, somewhat resembling the words, *clink, clink*, several times repeated, and strongly reminded me of the distant sound of the strokes on a blacksmith's anvil: and hence the name *arguta* appeared to me to be an appropriately specific appellation for this new species.

"All the nests I found of this species either contained young birds or were without eggs. The nest, which is of a large size, is generally placed on a horizontal branch of a low tree: it is round, deep, and cup-shaped, outwardly formed of sticks, and lined with fibrous roots and other fine materials."

The eggs of *Strepera arguta* are three in number for a sitting, oval in form, some specimens being somewhat pointed at the smaller end, the shell being close-grained, and its surface smooth and slightly lustrous. Typical eggs vary in ground colour, from a dull vinous-white to vinous-grey, which is streaked, spotted, or irregularly blotched with pale-brown, and almost obsolete underlying markings of dull bluish-grey. Some specimens have the markings small, well-defined, and rounded; in others, as shown in the figure, the subsurface markings are scarcely visible, or are entirely absent. A set of three taken at Bothwell, Tasmania, on the 10th August, 1887, measures as follows:—Length (A) 1.8×1.21 inch; (B) 1.81×1.23 inch; (C) 1.79×1.2 inch. Another set of three measures—(A) 1.85×1.25 inch; (B), 1.87×1.25 inch; (C) 1.87×1.26 inch. The eggs of this species may be generally distinguished by their very much paler ground colour, and markings.

In his MS. notes, Dr. Lonsdale Holden writes:—"I saw two or three examples of *Strepera arguta* between Bellerive and Rokeby, in the bush by the road side, close to the top of the ridge, over which the road passes. This species differs from *S. fuliginosa*, as regards colour, most notably in having the under tail-coverts white. It has a loud, shrill, metallic cry. On the 17th December, 1899, near the Styx River, four miles above Bushy Park, I observed a pair looking after two young ones, just able to fly: the latter were more slaty-coloured than the adults. In the following March I saw several on the extreme top of a wooded hill, on the ridge above the railway to Cambridge. I never met with the Hill Crow-shrike during my residence in the north-western portion of Tasmania."

August and the four following months constitute the usual breeding season of this species.

Strepera melanoptera.

BLACK-WINGED CROW-SHRIKE.

Strepera melanoptera, Gould, Proc. Zool. Soc., 1846, p. 20; Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 61 (1877).

Strepera intermedia, Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 59 (1877).

ADULT MALE *General colour above and below brownish black, slightly lighter on the under parts; face blackish; primaries and secondaries brownish-black, narrowly and indistinctly edged with brown at the tips; tail feathers brownish-black, largely tipped with white which increases in extent towards the outermost feathers; under tail-coverts, pure white; bill and legs, black; iris yellow. Total length 19 inches, wing 11 2, tail 9.3, bill 2.85, tarsus 2.6.*

ADULT FEMALE *Similar to the male in plumage, but slightly smaller.*

Distribution — South Australia, Kangaroo Island.

CONSIDERABLE difference of opinion has for a long time existed as to the validity of the present species. Gould, who originally described it in the Proceedings of the Zoological Society in 1846, places it in his "Handbook to the Birds of Australia" as a synonym of the preceding species, *S. arguta*, and on which he makes the following remarks: "Upon a careful examination of the numerous specimens of this bird contained in my collection, I find among them two very singular varieties: one with the base of the primaries of a nearly uniform black, and the tips white, and another in which the base of the primaries is white and the tips black. It is evident, therefore, that the markings of this species are not constant, and this induces me to believe that the bird I characterized as *S. melanoptera* is nothing more than one of the varieties above mentioned. I do not, however, venture to affirm that the birds received from South Australia, with wholly black wings, may not prove to be distinct from those from Tasmania; this is a matter for investigation by future Australian naturalists. For the present I sink the appellation *melnoptera* into a synonym."

In the "Catalogue of Birds in the British Museum," Dr. Sharpe makes the following observations after his description of *S. melanoptera*†:—"This species has been united by Mr. G. R. Gray, and even by Mr. Gould himself, to *S. arguta*. I have examined most carefully the series mentioned by the latter gentleman in his 'Handbook,' and I cannot see any variation in the amount of white in the wing of *S. arguta*, and I believe that the last named species is the Tasmanian Hill-Crow, and that its place on the continent is occupied by *S. melanoptera*." Also after his description of *S. arguta* Dr. Sharpe makes the following remarks‡:—"If we consider the big *Strepera arguta* of Van Diemen's Land to be the typical species of the group of the genus *Strepera*, we find three very closely allied species, whose exact relations time and a larger series of specimens are necessary to determine. I have separated the smaller form from Port Lincoln as *Strepera intermedia*, as well as the South Australian *S. melanoptera*; but whether these grade into one another, or into *S. arguta*, must be proved by the comparison of a larger series; they seem to me at least to have distinct habitats."

I agree with Dr. Sharpe that the specific characters of adult examples of *S. arguta*, of Tasmania, are constant, and it may be readily distinguished by its average larger measurements, the very distinct darker edges to the feathers of the upper parts, and the pure white bases to the inner webs of the primaries.

To clear up the uncertainty that has existed so long as regards the validity of the continental form originally separated by Gould under the name of *S. melanoptera*, and yet another more

* Handbk. Bds. Austr., Vol. i., p. 172 (1865).

† Cat. Bds. Brit. Mus., Vol. iii., p. 61 (1877).

‡ *id.*, p. 59.

recently described by Dr. Sharpe, I have now before me a large series of these birds gathered together from widely separated localities in South Australia; our own collection being supplemented by examples kindly lent by the Trustees of the South Australian Museum, and by Mr. Edwin Ashby, of Adelaide. Among them are specimens from Port Lincoln, the Flinders Range, Mt. Compass, Yorke's Peninsula, Mt. Lofty Ranges, and an example from Laura, about one hundred and forty miles north of Adelaide.

Strepera melanoptera of South Australia, of which a not quite adult specimen has also been described by Dr. Sharpe under the name of *S. intermedia*, is a smaller and closely allied form of *S. arguta* of Tasmania. Gould's original description, also the one given above of *S. melanoptera*, have been taken from very old specimens, having the general colour of the plumage darker, and having lost the white bases to the inner webs of the primaries, although when the wing is spread and closely examined a faint ashy-brown wash may be seen on that portion of the primaries that was originally white. In not quite adult specimens the general colour of the plumage is more strongly shaded with brown, the bases of the inner webs of the primaries are white, and their tips, also of the primary coverts and secondaries, are more or less edged or tipped with white or brownish-white. Even in breeding plumage, and fully adult birds, these tips are sometimes retained, but the white bases to the inner webs of the primaries of fully adult birds are gradually overspread with a brownish-black wash, until they are nearly of a uniform brownish-black. Between the two described stages of the plumage of *S. melanoptera*, specimens may be found with the bases of the inner webs of the primaries varying from white to brownish-black, this being effected by a gradual change of colour in the feather, and not by moult. Age, however, is an important factor in the entire absence of the basal marking to the inner web of the primaries, and as a rule specimens are found with it more or less indicated. The wing measurement of fully adult birds varies from 10.3 inches in the female to 11.2 inches in the male.

From *S. arguta* of Tasmania, adult specimens of *S. melanoptera* may be distinguished by their smaller size, the almost entire absence of the darker margins to the feathers of the upper parts, and by the more or less brownish-black wash to the white bases of the inner webs of the primaries, and in which, in very old birds, the inner webs of the primaries are almost uniform in colour.

While in South Australia I was informed that this species was numerous in the mallee scrub on Yorke Peninsula, and on Kangaroo Island; also in the higher scrubby stringy-bark ridges of the Mount Lofty Ranges near Adelaide. Mr. W. White found it breeding on Kangaroo Island in August; and in September, 1893, found eight nests in the mallee scrub on Yorke Peninsula, which, with one exception contained either two eggs or two young birds. Dr. A. M. Morgan found it breeding near Laura in September, 1890, and I saw numerous examples of its eggs from different parts of South Australia in the collection of Mr. A. Zietz.

Dr. A. M. Morgan, of Adelaide, to whom I am much indebted for information relative to many species of South Australian birds, writes me as follows:—Regarding *Strepera melanoptera*, I have met with this bird at Booleroo Centre, one hundred and sixty-four miles north of Adelaide, and at the Finnis, about sixty miles south of the metropolis. During the nesting season and the summer it inhabits thickly timbered country, large mallee for preference, but in the autumn and winter it is found in the more open country, and in the large gums bordering creeks. It is generally met with singly, or in pairs, and I have never seen more than two together. The flight is rapid, undulating, graceful, and noiseless, and the note, which is only uttered while on the wing, is a very loud ringing whistle, which can be heard at a great distance. They are insectivorous, but whether wholly so I am unable to say.

* The nest is built outwardly of fine sticks, and is lined with dry grass and rootlets. It is about the same size as that of *Gymnorhina lenconota*, but somewhat more evenly formed in its

outer structure. It is always placed in perpendicular forks, never on a horizontal branch, a long thin branch being preferred, often making the nest difficult to get at. Generally it is built in a large mallee, or gum growing in the scrub, but I have seen nests in low mallee, and one in a wattle which could be reached from horseback, but this is unusual. The eggs are usually three, though sometimes only two, and are undistinguishable from those of other members of the genus.

"This species breeds in September and October, and I know of no instance of a pair of birds bringing out more than one brood in the same season."

Eggs two or three in number for a sitting, varying in form from oval to rounded and elongate oval, the shell being close-grained and its surface smooth and slightly lustrous. The ground colour varies from a pale buffy-white to a rich vinous-brown, which is freckled, streaked, or blotched, with different shades of brown, the markings sometimes being uniformly distributed over the shell, in others predominating on the thicker end, where they become confluent, and form a more or less well defined cap or zone. Some specimens have a few very faint underlying markings of pale lilac-grey. Occasionally specimens are found that are evenly dotted and spotted with pale brown on a light buffy-grey ground colour. A set of two, taken on Yorke Peninsula by Mr. W. White measures (A) 1.60 × 1.12 inches; (B) 1.7 × 1.12 inches. Another set of two measures (A) 1.58 × 1.2; (B) 1.50 × 1.21 inches. Figure 10 of Plate Bt. is taken from an egg of a set of two, obtained by Mr. W. White on Yorke Peninsula in September, 1893.

Strepera cuneicaudata.

GREY CROW-SHRIKE.

Cracticus cuneicaudatus, Vieill. Nouv. Dict. d'Hist., tom. V., p. 356 (1816).

Strepera anaphonensis, Gould, Bds. Austr., fol. Vol. II., pl. 45 (1848); id., Handbk. Bds. Aust., Vol. I., p. 173 (1865).

Strepera cuneicaudata, Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 60 (1877).

ADULT MALE—*General colour brownish-grey, passing into a clearer grey on the rump and upper tail coverts, and ashy-grey on the lower breast and abdomen; face blackish brown; quills blackish-brown externally, washed with grey; tips of the secondaries and the basal half of the inner webs of the outer primaries white; tail blackish-brown, washed with grey, all but the two central feathers being largely tipped with white; bill and feet black; iris yellow. Total length in the flesh, 20.5 inches, wing 11, tail 8.8, bill 2.6, tarsus 2.6.*

ADULT FEMALE—*Similar to the male in plumage, but slightly smaller.*

Distribution.—Queensland, New South Wales, Victoria.

THE Grey Crow-Shrike, also known as the "Grey Magpie," is abundantly distributed throughout the humid mountain ranges and hills of eastern and south-eastern Australia. It has been recorded from as far north as Wide Bay in Queensland, and I have met with it in suitable localities throughout the greater portion of eastern New South Wales and southern Victoria. In South Gippsland, before the undergrowth was cleared, and many of the forest giants were felled for their timber, this species used to congregate in large flocks during the winter months. Especially they made themselves conspicuous by their united ringing notes, in drizzling weather, which was of common occurrence during that season of the year, before devastating bush-fires and the splitter's axe had denuded the humid hills of their luxuriant vegetation. In the early morning, roving flocks from ten to fifteen in number, would descend on the cleared portion around the house in search of newly-planted grain, and so tame were they that they would come up to within a few yards of the door of the log or bark hut. They were

extremely noisy, and would quarrel among themselves over a scrap of food thrown out to them. Several years after my first visit to the Strzelecki Ranges, the aspect of these thickly-timbered hills had, in many places, entirely changed. Large clearings had been made and cultivated, and a great proportion of the timber had been ring-barked, the original surrounding undergrowth cut and burnt, and the place sown with grass. Well-formed bush roads were made, and the bark huts were replaced with sawn-timber houses. The large flocks of Grey Crow-Shrikes had left the neighbourhood, and only now and again a solitary bird, or pair, would be heard, their ringing cries now being replaced by the flute-like notes of that close attendant on cultivation, the Black-backed Magpie or Piping Crow-Shrike (*Gymnorhina tibicen*). Since the cultivation of fruit trees in the district, I have been informed that the Grey Crow-Shrikes are again plentiful when the softer fruits are ripe, and which they sometimes attack.

The peculiar note which is usually uttered during flight is difficult to syllabicate. On the Strzelecki Ranges, a companion thought it more resembled the words "Gipps-land-for-ever" each repeated clearly and distinctly, and the last word accompanied by a ringing sound. When searching for insects in trees, or hopping from limb to limb, it also utters a low mournful whistle.

In New South Wales these birds are common on the Blue Mountains about Springwood and Lawson, and the surrounding districts, also about Moss Vale and Bundanoon on the southern line. They are extremely sociable birds, breeding in trees near one another, and are often seen in company with their congener, *S. graculina*. Unlike the latter species, however, they are seldom met with in open forest lands, and I have never observed them about the suburbs of Sydney.

Wild fruits, berries, and insects and their larvæ, constitute the natural food of this species. They spend a great deal of their time on the ground, eating locusts, grubs, caterpillars, and various seeds. They are not such notorious orchard marauders as *S. graculina*, but sometimes eat cultivated fruits, and later on devour the maize while in the cobs. Stomachs of these birds I have examined in the summer contained insects of various kinds, and the skins of fruits and berries; and in the autumn, principally maize. Personally I have never observed them attacking cultivated fruits.

The nest of this species is a large open structure, roughly formed externally of sticks, the inner cup being made of long fine twigs, which is again lined entirely with wiry rootlets or coarse dried grass-stalks. It averages externally fifteen inches in diameter by six inches in depth, and internally eight inches in diameter by three inches in depth. The nests are placed either in upright, leaning, or horizontal forks of a *Eucalyptus* or *Casuarina*, at heights varying from ten to forty feet from the ground. Two or three eggs are usually laid for a sitting, generally the former number, which vary in form from oval to rounded oval, the shell being close grained and its surface smooth and slightly lustrous. The ground colour varies from a pale buffy and pale chocolate-brown to a rich vinous-brown and vinous grey, the freckles, streaks, and small blotches on the different varieties being of a slightly darker and richer tint than the ground colour. In some specimens the markings are distinct, and uniformly distributed over the shell; in others predominating at one end, and forming caps or confluent patches. Specimens, especially those with the paler ground colours, have often underlying markings of various shades of dull bluish and slaty-grey. A set of three measures as follows: Length (A) 1.67 × 1.2 inches; (B) 1.7 × 1.22 inches; (C) 1.72 × 1.23 inches. A very distinctly marked set of two in Mr. R. J. Etheridge's collection, taken by him at Colo Vale on the 14th November, 1898, shows great difference in size: Length (A) 1.8 × 1.25 inches; (B) 1.58 × 1.15 inches.

Fledgelings have the feathers on the head, neck, mantle, and back centred and tipped with pale rufous-brown, the quills tipped with white; lores, feathers around the eye, and the chin blackish; the downy feathers on the under parts are dull grey, washed with fawn-brown, those

on the lower neck being much richer in colour. Young birds retain this pale fawn-brown wash on the neck when otherwise they are in full plumage. Like the Black and the White-backed Magpies (*Gymnorhina tibicen* and *G. leucanota*), the young of both the Pied and the Grey Crow-Shrike frequently leave their nests before they can fly very far, and are easily run down and captured. I observed several young ones about the bush at Bundanoon in November.

Mr. Kearland informs me that near the Werribee Gorge, in Victoria, he saw five nests of this species within an acre of ground. They were placed on the horizontal branches of Stringybark and Box trees, and all contained young, the brood ranging from one to three.

September, and the three following months constitute the usual breeding season.

Strepera plumbea.

LEAD-COLOURED CROW-SHRIKE.

Strepera plumbea, Gould, Proc. Zool. Soc., 1846, p. 20.

Strepera plumbea (sub-sp.), Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 60 (1877).

ADULT MALE—General colour dark leaden-grey, slightly lighter on the under parts; face blackish; wings black, outer webs of secondaries washed with grey; tips of the quills and the basal half of the inner webs of the outer primaries white; tail black, all but the two central feathers largely tipped with white; under tail coverts white; bill and legs black; iris yellow. Total length 20 inches, wing 11, tail 9½, bill 2½, tarsus 2½.

ADULT FEMALE—Similar to the male in plumage, but slightly smaller.

Distribution.—West Australia.

GOULD, who originally described *Strepera plumbea* in the Proceedings of the Zoological Society in 1846, unites it with the preceding species in his "Handbook to the Birds of Australia,"* but Dr. Sharpe has accorded it sub-specific rank in the "Catalogue of Birds in the British Museum."† As *S. cuneicaudata* is not found in South Australia, and there is no intergradation between the eastern and western races, I have here kept them separate, as the western birds may be easily distinguished by their darker plumage, and average thinner and straighter bills. In other respects the two races are alike. I find considerable variation in the size of adult specimens of *S. plumbea*, but, as in other species of the genus, the male is slightly larger; the wing-measurement of adult males varying from 10 to 11½ inches. Some specimens have the primaries narrowly edged with white at the tip.

Gilbert states that in West Australia he mostly met with it in the thickly-wooded forests, singly or in pairs, feeding on the ground with a gait and manner very much resembling the common Crow.

Mr. George Masters, who was collecting at King George's Sound, Western Australia, in March, 1860, on behalf of the Trustees of the Australian Museum, informs me that this species was very numerous in that neighbourhood, and its habits and mode of nidification are precisely similar to those of the eastern representative, *S. cuneicaudata*. In the original description, Gould gives the colour of the iris of this species as black; and by Dr. Sharpe in the "Catalogue of Birds in the British Museum," as brown; but in the specimens obtained by Mr. Masters, and in a pair recently received from the Perth Museum, and others examined by me, it was noted as yellow, as in all other species of this genus.

The eggs are usually two, sometimes three in number, for a sitting; oval, or elongate-oval in form, the shell being close-grained and its surface smooth and slightly lustrous. They vary

* Handbk Bds. Aust., Vol. i., p. 173 (1865).

† Cat. Bds. Brit. Mus., Vol. iii., p. 60 (1877).

in ground colour from pale to rich vinous-brown, and are freckled, streaked, or blotched with slightly darker shades than the ground colour, the markings on some specimens being uniformly distributed over the shell, in others forming an irregular shaped cap or zone on the larger end. A set of two measures as follows:—Length (A) 1.72×1.2 inches; (B) 1.73×1.23 inches. A set of three measures (A) 1.67×1.18 inches; (B) 1.65×1.15 inches; (C) 1.65×1.2 inches.

Strepera fuliginosa.

SOOTY CROW-SHRIKE.

Craicticus fuliginosus, Gould, Proc. Zool. Soc., 1836, p. 106.

Strepera fuliginosa, Gould, Bds. Austr., fol., Vol. II., pl. 43 (1848); id., Handbk. Bds. Austr., Vol. I., p. 170 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 61 (1877).

ADULT MALE—*General colour sooty black, darker on the upper parts; bases of the inner webs of the primaries white, a broad band at the tips of the outer ones, and a narrow edge at the tips of some of the secondaries, white; tail dusky black, all but the two central feathers tipped with white; bill and legs black; iris yellow. Total length 18 inches, wing 10.3, tail 8.2, bill 2.6, tarsus 2.5.*

ADULT FEMALE—*Similar to the male in plumage.*

Distribution.—Tasmania, and most of the larger islands in Bass Strait, South Australia, Victoria, New South Wales, Queensland.

LIKE *Strepera graculina*, on the continent, the present species is known in Tasmania, over which it is widely distributed, as the "Black Magpie." It is also found on most of the larger islands of Bass Strait, and is common in some parts of Victoria; Gould also records that a few individuals have been found in South Australia. Hitherto it has not been regarded as an inhabitant of New South Wales, but during a twenty-five years' residence in the south-western portion of this State, the late Mr. K. H. Bennett met with it on three occasions. The last one he observed was in an unusual situation, in a mallee scrub in the most arid part of the Mossgiel district, and far from any permanent water. I have never heard of any species of the genus being found in similar country, but that *S. fuliginosa* has a still more widely extended range is proved by my receipt of a specimen for identification that was obtained, with its nest and eggs, in a mountain range in central Eastern Queensland.

Respecting this species, Mr. G. A. Keartland writes me as follows:—"Along the shores of King Island, in Bass Strait, these birds are particularly numerous, especially on the west and south coasts. They are seldom found more than a mile from the beach, which furnishes them with an abundance of food in the form of larvae, obtained amongst the decaying kelp and other matter washed ashore. At times the ground is almost black with the large flocks which assemble morning and evening to feed. When flying to or from their feeding ground, they keep up an incessant chattering scream, somewhat like the note of the Black-breasted Plover (*Sarcophorus tricolor*). The Sooty Crow-Shrike is also abundant in parts of Victoria. It is plentiful at Bayswater on the side of the Dandenong Ranges, but as it is accused of making sad havoc amongst the softer fruits—such as strawberries and plums—a constant warfare is waged against it by the fruit-growers."

The fruit-eating proclivities of this species is confirmed by a note received from Mr. E. D. Atkinson, while resident at Table Cape, on the north-west coast of Tasmania, who writes:—"These birds occur on my farm and are very fond of fruit. At one time there was about a dozen of them. I used to feed them regularly with small bits of apples, and they became so tame that they would eat out of my hand and follow me into the house, though they were very quarrelsome amongst themselves. They are widely distributed in the north-western portion of Tasmania, and I have met with them on most of the larger islands I have visited in Bass Strait."

While resident at Circular Head, Dr. L. Holden observed several of these birds in the autumn, and which remained about Highfield all the winter: he also saw some on Robbin Island. He writes that they were very numerous at Rocky Cape in July, and at Woolnorth in November. In the former locality they were extremely tame, feeding from the pig-sty, and allowing one to approach within a few feet.

Many nests of this species were found by Mr. W. Grave, on King Island, during 1894-5. They were large, open, bowl-shaped structures, formed externally of sticks, and lined inside with rootlets, dried grasses, or strips of bark, and averaged fourteen inches in external diameter by a depth of six inches, and seven inches across inside by a depth of three inches. They were built chiefly in Tea trees, at varying heights from twelve to forty feet, and contained mostly two, sometimes three, and in one instance four eggs for a sitting. The eggs vary from oval to elongate oval in form, the shell being close-grained and its surface slightly glossy. In ground colour they vary from a pale to a rich vinous-brown, which is irregularly blotched, spotted, or streaked with darker shades of the ground colour, intermingled in some specimens with similar underlying markings of faint bluish or inky-grey. As a rule the markings are distributed all over the shell, and are larger on the thicker end; in some specimens the markings form large coalesced patches, or faint clouded underlying smears on one side or end of the shell. A set of three, taken by Mr. Grave on the 18th November, 1894, measures as follows: Length (A) 1.7 x 1.2 inches; (B) 1.74 x 1.19 inches; (C) 1.73 x 1.2 inches. A set of two measures (A) 1.68 x 1.16 inches; (B) 1.67 x 1.18 inches.

From the data of eggs taken in different parts of Tasmania, on King Island, and in Queensland, October and the three following months appear to constitute the normal breeding season of this species.

Genus STRUTHIDEA, Gould.

Struthidea cinerea.

APOSTLE-BIRD.

Struthidea cinerea, Gould, Proc. Zool. Soc. 1836, p. 113; *id.*, Bds. Austr., fol., Vol. IV., pl. 17 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 472 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 140 (1877).

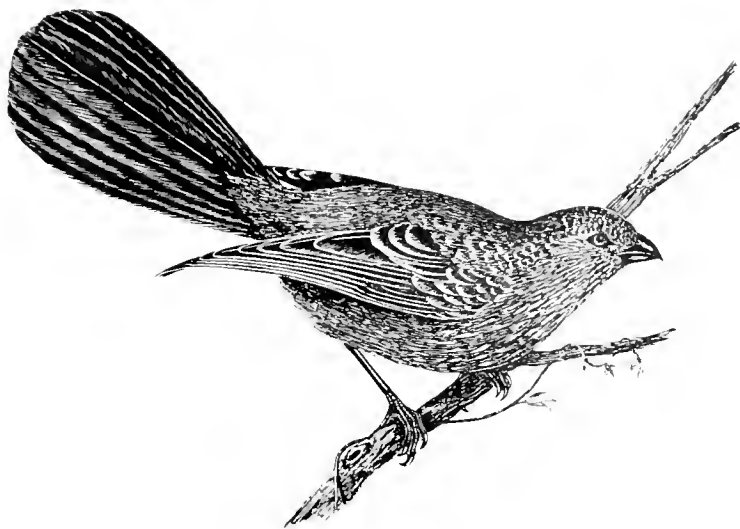
ADULT MALE. *General colour above and below grey, the feathers of the head, neck, and chest, having lighter grey tips, and those of the back washed with brown; wings pale brown, the primaries externally edged with light ashy-brown, and the secondaries darker brown except on the margins of the feathers; tail feathers black, slightly glossed with metallic-green; bill and legs black; iris pearly-white. Total length in the flesh 1.3 inches, wing 6, tail 6.4, bill 0.9, tarsus 1.55.*

ADULT FEMALE.—*Similar to the male in plumage.*

Distribution.—Northern Territory of South Australia, Queensland, New South Wales, Victoria, South Australia.

THIS species is found only in the inland portions of northern, eastern and south-eastern Australia. It frequents open forest-lands and low pine-covered hills, and is seldom met with in the scattered belts of timber growing out on the plains. Usually it is seen in small flocks, from six or seven to twelve in number, feeding on the ground beneath the branches of some wide-spreading tree. When disturbed, these birds take refuge in the lower limbs, and rapidly proceed to the topmost branches in a series of leaps, uttering at the same time harsh grating cries, and rapidly elevating and lowering their tails. From their habit of associating in flocks,

they are known nearly all over New South Wales, and the south-eastern portions of Queensland, as the "Twelve Apostles," a name also shared in some parts with that of "Happy Family" for *Pomatostomus temporalis*. Between the Namoi and the Gwydir Rivers, I found these birds particularly shy and wary, but in the Western District of New South Wales, and in Southern Queensland I have known them to become extremely tame and familiar, readily



APOSTLE BIRD.

entering on to verandahs of outlying stations in search of food and water, and feasting upon bread and cake thrown to them. While feeding on the ground they are very active, hopping here and there, and keeping up an incessant chattering note, which although hard to describe, if once heard can easily be again recognised. I once heard it in Hyde Park, Sydney, on the 12th June, 1895, and saw what was evidently an escaped bird, for later on I observed two of its wretched compatriots in a small wire cage for sale in George-street.

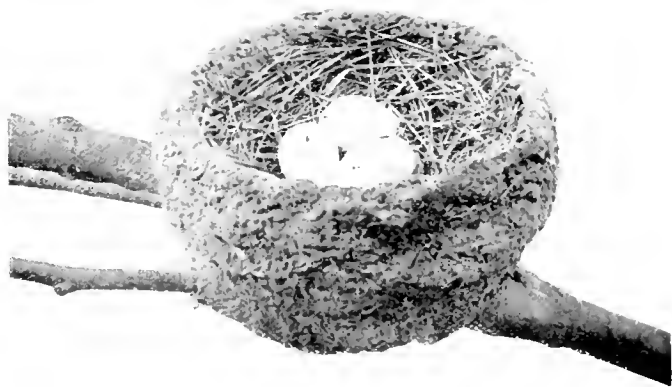
Stomachs of these birds I have examined, contained insects of various kinds.

The nest is a round, bowl-shaped structure, being slightly narrower at the rim, and is formed of pellets of mud mixed with bits of grass, and is lined inside with dried grasses; some nests have a few feathers worked into the lining. Like *Corcorax melanoramphus*, in arid localities advantage is taken to obtain the mud for nest-building after a passing thunderstorm, and of recent years from the edges of the sheets of water formed by artesian boring. Since the introduction of artesian boring in the States, it has had a direct influence on the breeding of many species. Birds frequenting arid situations, and forming their nests of mud, now resort to the edges of these miniature lakes to obtain the necessary building material. Among the stunted and saline growth too, sprung up around the shores of these artificially-formed sheets of water, many of the smaller Waders now breed regularly, where formerly they bred only in wet seasons. The Anacora bore, situated fifty miles east of Charlotte Waters, in one of the driest portions of the lower Northern Territory, where previously there was no water at all, has formed a lake half-a-mile long and quarter of a mile broad.

Before the introduction of artesian boring in New South Wales, at Coombie, in the Western District, the late Mr. K. H. Bennett records finding a female sitting on her nest when to his certain knowledge there had been no rain for the previous five months, and the nearest water was twenty miles away, showing that this species occasionally resorts to a nest of the previous season. Mr. E. L. Ramsay informs me that in August and September, 1889, at Wattagoona Station, near Louth, he found several nests, containing eggs, with one inch of the upper part and rim of the nest formed of emu- and cow-dung.

An average nest measures externally five inches and a half in diameter, by three inches and a quarter in depth, the inner cup measuring four inches and a half in diameter by two inches and a quarter in depth. It is usually built on a thin horizontal branch of a Eucalyptus or Casuarina, a favourite tree being the Bull-Oak or "Belar" (*Casuarina glauca*), at a height

varying from ten to sixty feet from the ground. Eggs four or five in number for a sitting, varying in form from oval to elongate and rounded-oval, the shell being close-grained and its surface smooth and slightly glossy. They are of a pale bluish or skim-milk white ground colour, sparingly dotted, spotted, blotched, or streaked with purplish-black, umber, and slaty-grey, and similar underlying markings of pale purplish or bluish-grey. In some specimens the spots are rounded and nearly black, in others irregularly shaped, and frequently they appear as if the colour had been placed on the shell when wet, and had run to one end or side of the marking. Occasionally eggs are found as figured on Plate IV., beautifully marked with longitudinal streaks like the eggs of the genus *Ptilorhis*, being slaty- or purplish-grey at one end of the streak and running into umber or blackish-brown on the other. I have also seen eggs of this species entirely devoid of markings. Typical eggs, however, cannot be confused with those of any other Australian bird. An average set of five measures as follows:—Length (A) 1.2×0.88 inches; (B) 1.3×0.87 inches; (C) 1.22×0.85 inches; (D) 1.23×0.87 inches; (E) 1.21×0.88 inches. Another set of four measures:—(A) 1.1×0.86 ; (B) 1.1×0.84 inches; (C) 1.14×0.84 inches; (D) 1.2×0.87 inches. Nests are occasionally found containing as many as eight eggs, evidently the result of two females laying in the same nest, but I have never heard of several birds assisting in the building of a single nest, like *Corcorax melanorhamphus*.



NEST AND EGGS OF THE APOSTLE-BIRD.

Two young birds in the collection, shot at Belaringar, New South Wales, on the 11th December, 1899, from a flock of twelve in the normal plumage, are dull creamy-white above and below, slightly tinged with brown, which is more distinct on the back, rump, and upper tail-coverts; tail-feathers pale brown; bill and legs pale fleshy-brown. Wing 5.5 inches.

August, and the four following months, constitute the usual breeding season of this species, but nests containing fresh eggs have been taken in Queensland, in the middle of January.

The nest figured, received from Mr. L. H. Lane, was taken at Wambangalang Station, in October, 1899, and another containing four young ones, was procured on the 7th November following. With these nests, Mr. Lane sent the following note:—"Every nest of *Struthiella cinerea* we climbed to this year, before eggs were laid, the birds deserted, some six or seven altogether."

Young birds are duller in colour than the adults, the under-surface is washed with brown, and the light greyish tips to the feathers of the throat and chest are absent. Wing 5.5 inches.

Sub-Family FREGELINÆ.

Genus CORCORAX, *Lesson.***Corcorax melanorhamphus.**

WHITE-WINGED CHOUGH.

Coracias melanorhamphus, Vieill., Nouv. Dict. d'Hist. Nat., tom. VIII., p. 2.

Corcorax leucopterus, Gould, Bds. Austr., fol. , Vol. IV., pl. 16 (1818).

Corcorax melanorhamphus, Gould, Handbk. Bds. Austr., Vol. I, p. 470 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 149 (1877).

ADULT MALE—General colour sooty-black, slightly glossed with green on the upper parts; inner webs of the primaries, except at the base and tips, white; bill and legs black; iris scarlet. Total length in the flesh 18 inches, wing 9.5, tail 9, bill 1.1, tarsus 2.5.

ADULT FEMALE—Similar to the male in plumage.

Distribution.—Queensland, New South Wales, Victoria, South Australia.

THIS species, which shares with *Strepera graculina* the local name of "Black Magpie," is in favorable situations, freely distributed throughout the greater portion of eastern and south-eastern Australia. It evinces a decided preference for open forest and table-lands, and is occasionally met with in clumps of timber on the plains. I found it very abundant in the neighbourhood of the Macquarie River, moving about in small flocks of from five to ten in number, and passing most of its time on the ground. When disturbed by too close an approach, they would fly away, at the same time uttering harsh grating cries of alarm. Their actions in the trees are very similar to those of *Struthidea cinerea*, and *Pomatostomus temporalis*, hopping quickly from limb to limb, and spreading and rapidly elevating their tails in a curious manner. The usual call-note is a low mournful kind of whistle, but it can be heard for a considerable distance.

The food of the White-winged Chough is extremely varied. In spring and summer it consists chiefly of insects and their larvae; the bird also ventures into orchards and gardens to feed on the softer kinds of cultivated fruits. Wattle and thistle seeds are eaten in the autumn, and about arable lands hungry troops of these birds descend on the newly-sown wheat-fields to pick up the grain. It is also troublesome in vineyards at vintage-time. At the homestead on Yandembah Station, a flock of six used to live in the trees around the house, and would come to be fed regularly every day in winter with the fowls; and on one occasion the late Mr. K. H. Bennett observed them wading thigh-deep in a muddy pool and busily engaged in capturing and eating tadpoles, with which the water was teeming. Mr. A. M. N. Rose informs me that he kept several of these birds in confinement, and for a period of six weeks he fed them only on grain.

The nest is a large and very conspicuous bowl-shaped structure, outwardly formed of pellets of mud, mixed with bits of short dried grass, and lined inside with opossum fur, dried grasses, strips of bark, or sheep's wool. Several birds assist in the construction of each nest, and frequently three or more may be observed busily engaged at the same time on one nest. An average nest measures externally nine inches in diameter by six inches in depth; but one I saw taken in the Riverina District, resembling a small wash-hand basin, was unusually large, and measured twelve and a half inches in diameter by eight inches in depth. Usually they are built on a horizontal branch, sometimes at the junction of three or more upright branches, and occasionally inside the deserted nest of *Corone australis*. It is remarkable that the latter site is ever selected, as the Raven is always on the alert to rob the White-winged Chough of its

eggs. In open forest and table-lands, the nest is usually built in a *Eucalyptus*. When built in arid localities, it is placed on any suitable branch, and often many miles from permanent water, advantage being taken to obtain the necessary mud from the shallow pools of water left by some passing thunderstorm. Of recent years, in the western parts of New South Wales and Queensland, the mud is often procured from the margins of the sheets of water formed by artesian boring in these hitherto dry tracts of country.

The flock of six birds, previously referred to at Yandembah homestead, all assisted in the construction of a nest. It was commenced on the 1st June, 1889—the season being an unusually wet one, and the birds breeding very early—and on the 12th July the late Mr. K. H. Bennett took from it five slightly incubated eggs.

The number of eggs varies, according to the number of birds in the community belonging to each nest. Four or five are more frequently laid, sometimes six, and on rare occasions eight, but on Wambangalang Station, near Dubbo, in October, 1883, Mr. E. H. Lane took nine eggs from a nest of this species. In several instances, however, I have found nests with only two or three incubated eggs, or young ones. Each of these nests was evidently occupied by only one female. It is possible that they may have had portion of their contents abstracted by a Raven or Crow, for these birds are always ready to plunder the nests of the Chough. There is safety in numbers, however, and should a Raven attempt to disturb a sitting bird belonging to a community, her angry cries at once bring a flock of excited birds to her assistance, and the intruder has to beat a hasty retreat. It is a difficult matter to decide how many females lay in a single nest, but in a large number of sets now before me, the greater portion of the eggs belonging to the sets of four, or five, from each nest are, as a rule, alike in shape, size, colour, and disposition of markings. Many sets, however, contain two or more distinct types of eggs, the variation increasing with the greater number in the set.

A nest in the Group collection, taken by Mr. H. L. White at Belltrees, near Scone, on the 8th September, 1898, is outwardly constructed of mud, mixed with grass and strips of bark, the inside being lined with bark fibre and opossum fur. It measures externally ten inches and a half in diameter, by five inches and three-quarters in depth; internally eight inches in diameter by three inches and a half in depth. This nest was built in a "Yellow Box" tree, and contained three young ones and an addled egg. On the 28th August, 1896, Mr. H. L. White forwarded to the Museum five unblown fresh eggs, taken from a nest in the same tree, and built by apparently the same community of birds, six in number. The eggs are of two fairly distinct types, two of them being oval with the inky-grey markings predominating, the remaining three short rounded ovals with the olive-brown blotches more numerous than the inky-grey markings, still it is possible for all to have been laid by one female, for frequently nests of other species are found with two very distinct types of eggs in the sitting.

The eggs vary from oval to elongate oval, and thick ovals are not uncommon, others are rounded or pointed at either end, and some are slightly pointed only at the smaller end, the shell being thick, coarse-grained, and minutely pitted, although as a rule slightly glossy, while others have the surface dull and lustreless. The ground colour varies from white to cream or pale brownish-white, which is boldly blotched and spotted with different shades, ranging from olive-brown to blackish-brown, and intermingled with similar underlying markings of slaty or dull inky-grey. As a rule the markings are evenly distributed over the shell, but in some instances they form large isolated patches of one colour laid over part of another, and confined to one side or end of the egg. I have an unusually small set of four, which, judging by their shape and colour are all presumably laid by the same bird. Three of them are very sparingly blotched with umber and blackish-brown, and the other egg of the set has small dots, spots, and large confluent patches, the latter entirely obscuring the ground colour on the greater portion of one side. The eggs of this species, however variable, cannot be confused with those

of any other Australian bird. A set of five measures as follows:—Length (A) 1.765×1.15 inches; (B) 1.58×1.15 inches; (C) 1.59×1.14 inches; (D) 1.762×1.15 inches; (E) 1.763×1.14 inches. The set of five previously referred to, taken by Mr. H. L. White, measures:—(A) 1.48×1.13 inches; (B) 1.47×1.16 inches; (C) 1.5×1.18 inches; (D) 1.63×1.18 inches; (E) 1.56×1.2 inches. An unusually rounded set of four measures:—(A) 1.45×1.17 inches; (B) 1.5×1.2 inches; (C) 1.5×1.18 inches; (D) 1.51×1.16 inches.

Nestlings are covered with smoky-black down, the wing and tail-feathers first appearing, but the former showing no indication of the white inner web on the centre of the primaries; bill and legs fleshy-black. Young birds may be distinguished by their brownish-black primaries, long, downy feathers on the abdomen, and shorter bill.

August, and the four following months, constitute the usual breeding season; but, as pointed out, it is influenced by a heavy rainfall, nests in 1880 being commenced as early as the 1st of June.

Family PARADISEIDÆ.

Sub-Family EPIMACHINÆ.

Genus PTILORHIS, Swainson.

Ptilorhis paradisea.

RIFLE-BIRD.

Ptiloris paradiseus, Swains., Zool. Journ., Vol. I., p. 481 (1825); Gould, Bds. Austr., fol., Vol. IV., pl. 100 (1848).

Ptilorhis paradisea, Gould, Handbk. Bds. Aust., Vol. I., p. 591 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 154 (1877).

ADULT MALE—*General colour above and below rich velvety black, strongly glossed with purple; tail feathers velvety-black, glossed with purple, the two central ones shorter, and of a rich lustrous metallic-green; forehead, crown of the head, and nape, shining metallic green, margined on the hind neck with deep steel-blue; on the lower throat and fore-neck a triangular patch of shining metallic steel-green feathers; breast velvety purplish-black, the feathers on the lower breast edged, and those on the abdomen and flanks broadly tipped with olive-green; under tail-coverts black; bill and legs black; iris dark brown; tongue and inside of the mouth yellow. Total length in the flesh, 12 inches, wing 6.4, tail 4.3, bill 1.8, tarsus 1.4.*

ADULT FEMALE—*General colour above greyish-brown tinged with olive, the feathers on the crown of the head darker and having narrow buff shaft stripes; primaries, secondaries, and greater wing-coverts, brown strongly washed with orange-rufous, the lesser and median coverts like the back; tail-feathers brown, slightly washed with orange-rufous; over the eye and extending along the side of the head is a dull white line, some of the feathers being narrowly edged with dark brown; sides of the head and neck brown, with narrow buff shaft stripes, like the crown of the head; throat and neck buffy-white; remainder of the under surface buff with a wavy V-shaped black marking on each feather, these markings becoming straighter and more indistinct on the flanks and under tail-coverts; bill and legs black; iris dark brown. Total length 11.3 inches, wing 5.9, tail 4, bill 1.7, tarsus 1.4.*

Distribution.—South-eastern Queensland, North-eastern New South Wales.

THE Rifle-bird, with its combined metallic and velvet-like plumage, is one of the most handsome birds in Australia. Its stronghold is the dense brushes lying between the Tweed and Clarence rivers, in New South Wales, and it is more abundantly distributed near the head-waters of these rivers than the coast. In Queensland its range extends as far north as Port Mackay; and an adult male has been received in the flesh by the Trustees of the Museum

from as far south in New South Wales as Dungog, on the Williams River, an affluent of the Hunter River. About the scrubs at the head of the Orara, Macleay, and Bellinger rivers, it is freely distributed, and Mr. B. Lucas informs me that he has sometimes seen it associated with flocks of the Regent Bower-bird, the Satin Bower-bird, and the Cat-bird. Writing on the birds of Queensland, Dr. Ramsay makes the following remarks :- "The most northerly point that I met with *Ptilorhis paradisea*, was at Port Mackay, on the Pioneer River; it was there considered a very rare bird. I have heard of its being occasionally met with in the ranges near Gympie. This bird is very similar to *Climacteris* in its actions. While encamped for some three or four months in the ranges of the North Richmond river, New South Wales, the great stronghold of this species, I had abundant opportunities of studying its habits, and was struck with the similarity of its actions to our Tree-creepers. The young males and females, seldom accompanied by more than one adult male in livery, are frequently met with together, traversing the stems and thick branches of the trees, especially those showing signs or in a state of decay.

"The call-note of the adult male is a shrill scream, easily imitated sufficiently to attract its attention, and cause it to remain until one approaches. By this means I have frequently watched it closely as it hopped round the bole of some decaying tree, or tore off the loose bark in search of insects.

"Seldom more than one adult male is found to every quarter of a square mile of scrub, and so little do they wander about that it was customary for me to return to the same locality until I had shot the bird, being quite sure of hearing him calling if he had not been destroyed in the meantime. These old males are usually solitary, but two or more occasionally meet in a favourite feeding-tree, when a fight is sure to ensue. Although closely resembling the *Climacteris* in their actions, they differ in this respect, that they may be found feeding on the fruit of the native Tamarind."

Mr. R. Grant, who was collecting in 1892, at Glennifer, on the North Arm, Bellinger river, informs me that the male flies from limb to limb until it reaches the top of a tree, in a similar manner to the Lyre-bird, and then rapidly flies down in a slanting direction, accompanied by that peculiar rustling noise made during flight by the wings of the males of this genus. He did not hear the male commence to call until August, and those he obtained prior to that month were observed by hearing pieces of bark and debris falling from the trees, while they were engaged in their search for insects lurking underneath the bark or among the Bird-nest or Stag-horn Ferns. The birds remained very quiet when discovered, and only ventured to peer around the bole of the tree when he scraped his feet on the ground, their curiosity being aroused by this action enabling him to get a shot and secure them. One female he shot while feeding on the ground, the only time he has observed either species of this genus so engaged. This specimen has an unusually long bill, measuring 2·3 inches. The stomachs of all the birds he examined contained insects, procured chiefly underneath the bark of trees or among Bird-nest or Stag-horn Ferns, also a few small round seeds of a berry.

Mr. C. C. L. Talbot informs me that at West Moreton, in Queensland, he fired at a male *Ptilorhis paradisea*, and broke its wing. He kept it in confinement, feeding it chiefly on centipedes, which it preferred, also insects of various kinds. It was very lively, and quite reconciled to a cage. Neglect to supply the bird with its natural food, during his absence, was the ultimate cause of its death, after living in confinement for three months. In the same locality Mr. Talbot found a young one just fledged, at the base of a large tree, but although he carefully searched all around, he could not discover the nest. The young bird only lived three days.

Although the egg of this species was the last discovered of the genus *Ptilorhis*, its nest has been known for many years past. In my private collection, I have an egg of the Cat-bird, taken by a cedar-getter in the scrubs near Lismore, on the Richmond River, in October, 1883, but it did not come into my possession until after I had described an authenticated nest and egg of this species in 1891.¹ The discoverer of the former nest and egg also found at the same time a nest of the Rifle-bird, built in a mass of Lawyer-vines at the top of a tree about twenty feet from the ground. He described it as being somewhat similar in construction and form to the Cat-bird's nest, but built of finer material and smaller leaves, intermingled on the outside with a quantity of moss and the exuvie of snakes.

Since the receipt of this information, many nests and eggs of the closely allied species, *Ptilorhis victoriæ*, have been found in Queensland, and the nests discovered to be similar in construction. The first published description of the nest of the Rifle-bird (*Ptilorhis paradisea*), appeared in Dr. Sharpe's "Monograph of the Paradisidae and Ptilonorhynchidae," in Part II., 1893. It is from the pen of Mr. A. P. Goodwin, whose long residence in the Richmond River district has made him well acquainted with the habits of many species of the rich brush-land birds. From some interesting notes, given by him on the Rifle-bird, I extract the following information:—"Some years since, when in the scrub with some cedar-cutters in October, we discovered a nest in a small tree, the top of which was very densely covered with creepers. A native climbed the tree, but found the nest just completed, with no eggs. We left the nest undisturbed for three weeks, when we found that it had been abandoned. We took it down, and I found that it was built of sticks and leaves, similar to that of a Thrush; the inside was lined with snake-skins, and its diameter was about nine inches. This bird has on one occasion been taken to London alive by myself. It lived in the Zoological Gardens for several years."

The nests of *P. paradisea* are more bulky in form than those of its ally *P. victoriæ*, and are usually built in a mass of lawyer-vines. They are round open structures, formed of fine twigs, dead leaves, and vinelets, the exterior being covered with mosses, orchids, and cast snake-skins.

Two eggs, taken on the 2nd November, 1899, and kindly lent by Dr. Charles Ryan, of Melbourne, for description, are oval in form, one specimen being slightly more elongate, the shell being close-grained, and its surface smooth and glossy. They are of a rich reddish-cream ground colour, which is marked almost uniformly with numerous fleecy longitudinal streaks, blurred irregular shaped spots and dots of different shades of red, reddish-chestnut, purplish-red, and purplish-grey, many of the latter appearing as if beneath the surface of the shell, and assuming a dull violet-grey hue. The markings are larger and more numerous on the thicker end, especially on one specimen, although it has a long angular streak on the smaller end; on the other egg, with the exception of one or two broad blurred streaks, it is almost uniformly marked, the dull violet-grey underlying streaks being more pronounced on the thicker end. Length (A) 1.3×0.93 inches; (B) 1.38×0.92 inches.

Compared with a number of eggs of Queen Victoria's Rifle-bird, and Prince Albert's Rifle-bird, the above-described eggs of *Ptilorhis paradisea*, may at once be distinguished by their richer and darker ground colour, and by their smaller, and more numerous and evenly distributed longitudinal streaks.

The young male is similar to the adult female, except in having the throat similarly barred to the remainder of the under-parts. It is probable that the full adult livery of the male is not assumed until the end of the third season, like the Satin Bower-bird, judging by birds of the latter species I have in confinement. A young male Rifle-bird in the collection, shot at Port Macquarie, New South Wales, on the 13th November, 1862, is as above described, with a few feathers on the crown of the head changing into metallic-green at the tips; on the centre of the

¹ Rec. Aust. Mus., Vol. I., p. 111, figs. xii.-xiv. (1891).

throat are three small purple glossy feathers, those on the sides of the throat having blackish tips; a few of the abdomen and flank feathers have a blackish wash towards the tips, and there is a single dull blackish-purple feather with a bronzy-green tip. I regard this as a young bird of the previous season, about eleven months old. Further progress towards maturity is shown by a young male in the collection, obtained in the Richmond River District in October, 1870. This specimen has many of the feathers on the crown of the head and hind neck of a bronzy metallic-blue and green; the feathers on the sides of the face and upper portion of the throat are blackish; on the centre of the throat are a few metallic steel-green feathers, those on the lower portion being purple and having narrow metallic steel-green edges; the feathers on the centre of the breast, and the lower breast, are dull blackish-purple.

Like the Regent Bower-bird, the full adult livery of the male of this species is partially assumed by a gradual change in the colours of the feathers, as well as by moult. The time of the year when both of these birds were obtained will show that they must at least be the young of the previous season, and probably another twelve months would elapse before they assumed their full adult livery. Very old females have the sides of the face and the upper portion of the throat white.

From nests found in the Richmond and Tweed River scrubs, in New South Wales, and young birds obtained near the Brisbane River, Queensland, October and the three following months would appear to constitute the breeding season of this species.

Ptilorhis victoriæ.

QUEEN VICTORIA'S RIFLE-BIRD.

Ptiloris victoria, Gould, Proc. Zool. Soc., 1849, p. 111, pl. xii.

Ptilorhis victoria, Gould, Handbk. Bds. Austr., Vol. I., p. 493 (1865); *id.*, Bds. Austr., fol., Suppl., pl. 50 (1869); Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 155, (1877).

ADULT MALE—*General colour above and below rich velvety-black, strongly glossed with purple; tail-feathers velvety black glossed with purple, the two central ones shorter and of a rich lustrous metallic-green; forehead, crown of the head, and nape, shining metallic green with a coppery gloss; on the lower throat and fore-neck a triangular patch of shining metallic steel-green feathers with a slight purplish lustre; lower neck and chest rich velvety black glossed with purple; remainder of the under-surface oil-green, with velvety-black bases to the feathers; lengthened flank plumes velvety-black tipped with oil-green, some of the lower ones having a rich coppery-green lustre; under tail-coverts black; bill and legs black; iris dark brown. Total length 10.5 inches, wing 5.5, tail 3.4, bill 1.45, tarsus 1.55.*

ADULT FEMALE—*General colour above ashy-brown, the feathers of the head slightly darker and having narrow buff shaft streaks; lesser and median wing-coverts like the back; primaries, secondaries, and greater wing-coverts, brown washed with orange-rufous, and which is more conspicuous on the apical half of the outer secondaries; tail-feathers brown, tinged with olive; over the eye and extending along the side of the head a line of buffy-white feathers; chin and throat buffy-white, passing into fawn colour on the remainder of the under surface, which is spotted on the breast and indistinctly barred on the flanks with dark brown; under tail-coverts fawn colour; bill and legs black; iris dark brown. Total length 9 inches, wing 5, tail 3.2, bill 1.4, tarsus 1.35.*

Distribution.—North-eastern Queensland, from the neighbourhood of the Bloomfield River, south to the Herbert River.

THIS beautiful representative of the *Paradiside* in Australia was discovered by the late Mr. John MacGillivray on one of the Barnard Islands during the survey of the north-eastern coast of Queensland by the officers of H.M.S. "Rattlesnake," in 1811. On the mainland its range extends from the neighbourhood of Cardwell, as far north as the Bloomfield River District. During the voyage of the "Chevert" to the north-eastern coast of Queensland and New Guinea, in 1875, Mr. George Masters also succeeded in procuring specimens on one of the Barnard Islands. In 1887, and again in 1889, Messrs. E. J. Cairn and R. Grant procured an unusually large series of these birds on the Bellenden Ker Range, while collecting there on behalf of the Trustees of the Australian Museum.



QUEEN VICTORIA'S RIFLE-BIRD.

Regarding this species, Mr. Robert Grant, now Assistant Taxidermist at the Australian Museum, has kindly supplied the following notes:—"We found both sexes of Queen Victoria's Rifle-bird fairly distributed on the table-lands about the Upper Barron River, Lake Eicham, and Boar Pocket. I have also shot females at Riverstone, on the flats along the Mulgrave River, about sixteen miles from Cairns. It is, however, on the table-lands, in the dense and luxuriant tropical vegetation, in which palms, ferns, orchid-covered trees and vines flourish, that this lovely bird has its home. Each male seems to have a special haunt of its own, and when another of his own sex and species encroaches or trespasses on his domain they chase one another here and there through the foliage, but whether in sport or combat, I do not know. The male delights in swinging

and fluttering on some rope-like vine extending across a creek, or hanging from tree to tree, especially in a spot where the sun's rays filter through the canopy of leaves overhead. He is extremely active when searching for food among the bark of trees, stag-horn, bird-nest, and other ferns, arboreal orchids, and other epiphytes. One can hear, in the early morning, the harsh rasping-like note uttered at intervals by this species; but being difficult to imitate, great caution must be used in approaching them. The flight of the male is short but rapid; sometimes when one is seated in the scrub, the well-known rustle of the wings is heard as he flies quickly past. This noise, which resembles in sound the rustling of a lady's silk dress close by, is produced by the movement of the wing-feathers, and is confined to the males.

"One morning, when following a pebbly creek, I entered a small glade almost clear of trees, on the other side of which was part of a dead tree, almost denuded of its branches. On this tree I observed three or four birds, and from their strange and peculiar actions I concluded it was to me an unknown species. Trying to get within shooting range, I disturbed them and they quickly darted into the scrub. Early next morning, under cover of the scrub, I approached the tree from the opposite side, and managed to get close to it unobserved. Peering through the foliage, I was delighted to find the birds on the same branch as I saw them the previous day, and having a good view of them soon discovered they were Queen Victoria's Rifle-birds; one a fully plumaged adult male, the others females or young males, and evidently a pair of adults accompanied by their young. The brilliantly-plumaged male was spreading his wings in such a manner that the primary feathers of each wing were brought

close together right over his head, added to this there were the gorgeous metallic golden-green tipped plumes of his body spread out in circular form around his breast. The bill was pointed upwards, showing to advantage the resplendent green scale-like feathers of the throat, and giving the bird the appearance of a living jewel. All the time he was swaying his body backwards and forwards, and twisting and turning his head with seeming delight. The other birds kept hopping around him with out-spread wings, evidently taking great pleasure in his actions, and occasionally like him uttering their loud and somewhat discordant note. All the stomachs of the birds of this species we examined, contained insects, small fruits, berries, and seeds."

As pointed out by Gould in his "Handbook," and also in the Supplement to his "Birds of Australia," both the late Mr. John MacGillivray and the late Mr. F. Strange respectively noted the extraordinary noise made by the males of *Craspedophora alberti* and *Titilohis paradisea* during flight. To a less degree this sound may be produced by moving backwards and forwards the primaries and secondaries of a dried skin.

Mr. Robert Hislop, Junr., late of "Wyalla," Bloomfield River, who has found many nests and eggs of this species, writes me: "There are always a few of Queen Victoria's Rifle-birds about here, but they are more numerous about the beginning of July, remaining throughout the spring to breed, and departing again at the end of January. Usually they are met with in the scrubs, and I have often seen the females and young males running up the tree-trunks and branches in search of insects out in the open forest-lands, but never a fully plumaged male. In fact I have never observed the adult males except in the breeding season. These birds live chiefly on insects and berries, but they often come into the garden and eat the paw-paws and granadillas off our trees and vines. The nest is composed of long twigs, vines, rootlets, and broad leaves, and very often a cast-off snake-skin is worked into the outer portion of it. They are usually built in a Screw Pine (*Pandanus*), from five to fifteen feet from the ground. I have also found them in a Fan Palm (*Licuala muelleri*), and on one occasion in the leafy stems of a vine growing up the trunk of a Bean Tree (*Castanospermum australe*) at a height of thirty feet. On one Screw Pine, I found the nests of three successive seasons, and a pair of birds are building there again this year. Two eggs are laid for a sitting, and I believe two broods are sometimes reared in the breeding season, which commences early in September and continues until the middle of January. In one season I obtained three sets of eggs from the same pair of birds, robbing the nests as soon as each set was laid."

The nest is an open cup-shaped structure, outwardly formed of long stout twigs and broad leaves, the inner wall consisting chiefly of broad leaves, intermingled with long spiral tendrils of climbing plants, the latter material, with very fine and nearly straight plant stems, being also used as a slight lining for the bottom of the nest. In several nests I have examined, I find that thin sticks are used as well as strong twigs in their outer construction. An average nest measures externally six and a half inches in diameter by a depth of three inches; the inner cup four inches and a half by a depth of two inches. The eggs, usually two in number for a sitting, are remarkable for their richness of colour, and the character of their markings. They are of the usual Bird of Paradise type, and are doubtless among the most beautiful of any of our Australian birds' eggs. In shape they are typically true ovals, the shell being close-grained and its surface very glossy. The ground colour varies from a reddish flesh-colour to a warm creamy-buff, which is longitudinally streaked and sparingly freckled with different shades of red and purplish-red, intermingled with reddish-violet and purplish-grey markings, some of them appearing as if beneath the surface of the shell. Occasionally eggs are found with one or two light umber, or sienna streaks, intermingled with the typically coloured markings. In most specimens the longitudinal streaks are long, bold, and evenly distributed over the shell; in others the colours are laid one over or obliquely across another; in a few, conspicuous streaks

are formed, almost the entire length of the shell, of rich red on the larger end, and which gradually passes into purplish-grey on the smaller end. In rare instances a conspicuous patch of coalesced streaks will be found near the centre of an egg, otherwise it will be almost devoid of markings. A set of two measures as follows: Length (A) 1.27×0.91 inches; (B) 1.25×0.91 inches. Another set measures (A) 1.22×0.93 inches; (B) 1.21×0.9 inches. A set of two in the collection of Mr. Charles French, Junr., measures (A) 1.2×0.91 inches; (B) 1.23×0.9 inches.

The above sets were taken by Mr. R. Hislop at various times in the Bloomfield River District, North-eastern Queensland.

The bird figured represents an adult male.

Genus CRASPEDOPHORA, Gray.

Craspedophora alberti.

PRINCE ALBERT'S RIFLE-BIRD.

Ptiloris magnifica (nec Vieill.), Gould, Bds. Austr., fol., Suppl., pl. 51.

Craspedophora magnifica (nec Vieill.), Gould, Handbk. Bds. Austr., Vol. I., p. 595 (1865).

Ptilorhis alberti, Elliott, Proc. Zool. Soc., 1871, p. 583; Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 156 (1877).

ADULT MALE—General colour above and below velvety black, shaded with purple; quills blue-black; the lesser and median wing-coverts like the back, the greater coverts and inner secondaries glossed with purplish-blue; tail feathers velvety-black, the two central ones shorter, and of a lustrous metallic-green, the rest on either side glossed with the same colour on the outer web; forehead, crown of the head, and nape, shining metallic green; chin and sides of the throat rich purple; from the chin and extending out on to the chest there is a large triangular shield of lustrous metallic bluish-green feathers, which is bordered below by a narrow velvety-purple band and a second band of golden olive-green; remainder of the under surface dull purplish black tinged with olive, the flank feathers terminating in long silky plumes extending beyond the end of the tail; bill and legs black; iris dark brown. Total length from tip of bill to end of tail 12 inches, to ends of flank plumes 13.2, wing 6.8, tail 4.3, bill 2.1, tarsus 1.65.

ADULT FEMALE—General colour above, brown shaded with olive; quills brown strongly washed with orange-chestnut; wing-coverts dark brown; tail feathers orange-chestnut; a line over the eye white; lores dark brown; cheeks and throat dull white, separated by a line of dark brown at the base of the lower mandible; remainder of the under surface dull white, crossed with numerous blackish bars, wider apart and less distinct on the lower breast, flanks, and under tail coverts; bill and legs black; iris dark brown. Total length 11.2 inches, wing 6.2, tail 4.2, bill 2, tarsus 1.6.

Distribution.—Cape York Peninsula.

THAT rich belt of tropical flora extending along the coast range of north-eastern Queensland, is doubtless to a large extent, like portion of its avifauna, of Papuan derivative, and in it are found many species of birds, common alike to New Guinea, that are not represented in any other part of the continent. Among them, therefore, it is not surprising that several species in that region are close representatives of Papuan forms, and were regarded originally as belonging to the older and well-known insular species. To a marked degree Gould possessed considerable acumen in discovering the slightest divergence from the common type of a species, yet in this instance, although he noted differences too slight to be considered specific, he regarded the present species as being the same as one inhabiting New Guinea, *Craspedophora magnifica*, and describes it in his "Handbook to the Birds of Australia" under the older name.

The adult male of Prince Albert's Rifle-bird is distinguished from the closely-allied Magnificent Rifle-bird of New Guinea by its smaller size, and by the olivaceous wash to the feathers below the golden-green pectoral band. The female of the latter species, too, is very distinct from the continental form, in having the upper parts nearly uniform rufous, and the under parts more broadly and distinctly barred with dusky black.

Prince Albert's Rifle-bird is confined to the northern portion of the Cape York Peninsula, where it was first found by MacGillivray, and later on in considerable numbers by Mr. J. A. Thorpe. Specimens were also obtained by the members of the Chevert Expedition, in the same locality, during 1875. Mr. Thorpe, now Taxidermist at the Australian Museum, who had unusual facilities for studying the habits of this species during a lengthened stay at Cape York, has kindly given me the following notes:—"During my stay on the Cape York Peninsula, in 1867-8, I found Prince Albert's Rifle-bird frequenting the dense brushes in the neighbourhood of Somerset, opposite Albany Island. I never saw it in the open forest country inland, or even crossing the grassy belts which intersect the brushes in many places. The females, which are by no means shy, were often met with close to the settlement, but I never shot a fully adult male within two miles of Cape York. Each male has a certain haunt of its own, averaging about two or three hundred yards in diameter. It utters three loud rich notes and finishes off with a fourth much deeper in tone. At frequent intervals they call as a sort of challenge to each other; but when they trespass on one another's domain, and meet, they have a pitched battle. The males are very wary, and it is almost impossible to stalk them, but being of a jealous nature they will come readily on imitating their call within or near their haunts, usually approaching in an excited manner, the peculiar noise made by their wings being distinctly heard as they come within range. I have an idea that they are polygamous, as the few I have been able to stalk, when they would not respond to my answering call, I found were accompanied or surrounded by several females. On one occasion I heard a male calling frequently, and finding my notes in answer would not allure him, I managed after some time to carefully approach within about thirty-five yards of the place where he was calling. From there I could see him running up and down a partially fallen tree, held in position by some vines, and so intent on showing off his beauty to an admiring bevy of females that he did not heed my coming. After watching for a while his graceful and sometimes grotesque movements, I fired, and he fell; several females at the same time darting into the scrub. When I went to pick the bird up, I found two females dead beside him. During the moulting season, the males lose nearly the whole of their body feathers, and they look wretched objects for a few weeks, but soon assume their beautiful plumage again. The stomachs of those I examined contained insects and berries. Altogether one hundred and six fully adult males and eighty females and immature young males were obtained during my seventeen months' stay there."

From Somerset, Mr. Robert L. Jardine has kindly sent me the following notes:—"Prince Albert's Rifle-bird, although a resident species here, is extremely local in habits, and very shy and difficult to procure. In the early morning it is restless, and almost constantly flying about from tree to tree. The note of the adult male is three deep prolonged whistles, the last being the deepest and richest of all. These birds feed upon insects, and wild berries and fruits, and are particularly fond of a small native fig, which, when very ripe, contains a number of small grubs. In the breeding season, the male is very fond of 'showing off' by dancing on a bough, opening and closing its wings, and making a rustling noise similar to that made by very stiff silk being rubbed together. The proportion of females is very great, perhaps fifteen or twenty to one male. The nesting-place is usually in a Palm or Screw Pine in scrubs, and is generally situated in an angle at the junction of the leaves with the trunk, at a height varying from four to thirty feet from the ground. The nest is a cup-shaped structure, formed very roughly of twigs,

leaves, and vinelets, many of the leaves being utilised which have fallen into the angle from the surrounding and overhanging trees. They are very difficult to find, looking from the outside just like a bunch of dead leaves, and measuring from six to eight inches in external diameter according to the width of the frond angle in which they are placed. Two eggs is the number laid for a sitting. The breeding season commences in October, and continues through the four following months."

The nest figured is in the collection of the South Australian Museum, Adelaide, and is reproduced from a photograph, sent by the Director, Dr. E. C. Stirling. While recently in Adelaide, Mr. A. Zietz, the Assistant Director, kindly afforded me an opportunity of describing this nest, among others in the collection. It is placed between the nearly upright leaf-stalks



NEST OF PRINCE ALBERT'S RIFLE-BIRD.

of a Palm, and is an open cup-shaped structure formed chiefly of dead leaves and the stems of a climbing plant, the inside being sparingly lined with long, coarse, wire-like fibres. Externally it averages about seven inches in diameter by seven in depth, the inner cup measuring five inches across by two inches and a half in depth. This nest was taken at Somerset, near Cape York, and contained two eggs. It is worthy of note that cast snake-skins do not appear to be used by this bird in the construction of its nest.

The eggs are usually two in number for a sitting, and are small for the size of the bird, being but slightly larger than those of its lesser congener, Queen Victoria's Rifle-bird. They vary in shape

from true and thick ovals to elliptical and elongate-oval; some are slightly flattened on the larger end, others compressed near the centre, the shell being close-grained and its surface smooth and glossy. In ground colour they vary from dull white to creamy-white, and from sandy-buff to yellowish-buff, and this is marked with bold longitudinal streaks, and a few fine freckles of different shades of amber or yellowish-brown, intermingled with pale bluish-black or ink-like markings, some of the latter appearing as if beneath the surface of the shell. As a rule, the longitudinal streaks predominate on the larger end, and are on the surface. In most specimens they are well defined, in others the streaks are short and have a blurred look, as if the colour had been placed when wet on the larger end of the egg, and smeared with the finger longitudinally down its surface. All the markings, however, are of different shades of amber, brown, yellow, and bluish-black, or of an ink-like hue, and whether large or small, well defined or faint, are with few exceptions longitudinal, or have a tendency that way. A set of two

measures as follows:—(A) 1.32×0.98 inches; (B) 1.37×0.96 inches. Three eggs from different nests:—(A) 1.3×0.96 inches; (B) 1.33×0.91 inches; (C) 1.25×0.97 inches.

Figure I on Plate B III. is from a specimen which was kindly lent, among many others, by Mr. Charles French, Junr.

A beautiful set of eggs in Mr. G. A. Kearland's collection, taken by Mr. R. L. Jardine, at Somerset, measures:—(A) 1.3×0.96 inches; (B) 1.3×0.95 inches. Another set of two, taken by the same gentleman, measures:—(A) 1.35×0.92 inches; (B) 1.28×0.91 inches.

Although the eggs of Prince Albert's and Queen Victoria's Rifle-birds are almost equal in size, typical eggs of the former can readily be distinguished by their lighter ground colour and darker and less richly coloured markings.

Young males are similar to the adult females in plumage. Young males in change of plumage have some of the primaries blue-black, the hind-neck, mantle, lesser and median wing-coverts, and upper tail-coverts rich velvety-black; the lustrous metallic steel-green feathers first appearing on the nape, remainder of the upper parts as in the adult female; sides of the head, the throat, and fore-neck bare; from either side of the chest there is a line of olivaceous feathers spreading out on to the flanks where the plumes are slightly elongated and shaded with purple; remainder of the under-surface dull white with dark brown cross-bars, under tail-coverts and some of the under wing-coverts black. Wing 6.5 inches.

An old male in the moult has the forehead, sides of the head, hind-neck, throat, and centre of the fore-neck bare, the latter dividing the metallic steel-green shield in the throat and fore-neck, and which is destitute of the rich purple and the golden olivaceous bands immediately below it; crown of the head rich velvety-black. Wing 6.85 inches.

Sub-Family PARADISEINÆ.

Genus PHONYGAMA, Lesson.

Phonygama gouldi.

AUSTRALIAN TRUMPET-BIRD.

Mauicodia kerandreni (nec Less.), Gould, Bds. Austr., fol., Suppl., pl. 9.

Mauicodia gouldii, Gray, Proc. Zool. Soc. 1859, p. 158, note; Gould, Handbk. Bds. Austr., Vol. I., p. 236 (1865).

Phonygama gouldi, Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 181 (1877).

ADULT MALE—*General colour above and below glossy steel-green, less brilliant on the under parts; wing-coverts like the back; primaries blackish, glossed on their outer webs with steel-green; secondaries glossy steel-green on their outer webs, black on the inner, the innermost feathers entirely glossy bluish-green as are also the inner greater wing-coverts; tail feathers blackish, glossed with steel-green, which decreases in extent on the outermost feathers; head and tuft of lengthened narrow plumes on each side of the occiput steel green; feathers of the throat and neck lanceolate in form; abdomen and under tail-coverts dull purplish-black with dark greenish tips to most of the feathers; bill and legs black; iris red. Total length 12 inches, wing 6.5, tail 5.5, bill 1.15, tarsus 1.55.*

ADULT FEMALE—*Similar to the male in plumage, but slightly smaller, and the plumes on each side of the occiput much shorter.*

Distribution.—Cape York Peninsula.

LIKE Prince Albert's Rifle-bird, the present species is another instance of a closely allied northern continental form being mistaken for an older and well known Papuan species. Originally discovered by MacGillivray at Cape York, Gould figured and described it in his "Supplement to the Birds of Australia" under the name of *Manucodia keraudreni*. Four years after, Mr. G. R. Gray, in a note to a list of Birds collected by Dr. Alfred Russell Wallace at Dorey, New Guinea,^{*} pointed out that it was distinct from *M. keraudreni* and proposed for it the name of *M. gouldi*. According to Professor Alfred Newton,[†] the name of Manucode is an abbreviation from the French *Manucodiata*, the Latinised form of the Malay word *Manukderwata*, meaning "the bird of the gods," and a name applied apparently to Birds of



AUSTRALIAN TRUMPET-BIRD.

Paradise in general. Since the present species has been removed from the genus *Manucodia* into its proper place in the closely allied genus *Phonygama*, it might appropriately be distinguished by the vernacular name of Trumpet-bird, from its peculiar note. It is confined to the extreme northern portion of the Cape York Peninsula, and is the only representative of the genus in Australia. Mr. J. A. Thorpe found it freely distributed at Cape York in 1867-8, and Mr. George Masters obtained specimens in the same locality during the voyage of the "Chevert" to the north-eastern coast in 1875, and of which the latter remarks:—"A very noisy bird, and plentiful in the brushes about Somerset." During the voyage of "H.M.S. Challenger," the late Professor H. N. Moseley obtained two females on Albany Island, opposite Somerset.

Relative to this species, Mr. Thorpe has given me the following notes:—"I found Gould's

Manucode fairly plentiful in the dense brushes close to Somerset. Usually they are met with in pairs, high up in the fruit and berry-bearing trees, and frequently in company with other species. The males utter a very loud and deep guttural note, unlike that of any other bird I am acquainted with, and it astonished me that a comparatively small bird could make so much noise. In the trees they are very active in their movements, and on the appearance of an intruder evince more curiosity than timidity. I have frequently shot them by trying to imitate their notes, or by making a strange noise, when they would hop down from branch to branch in an inquisitive kind of way, as if trying to ascertain its source. The bird is particularly fond of the fruit of a certain species of fig; but the stomachs of those I examined contained insects, as well as fruits and berries of various kinds."

When placed in spirits for any length of time, the feathers of this bird change in colour from a steel-green to dull oil-green.

Although *P. gouldi* and *P. keraudreni* so closely resemble each other in size and colour, the former being a uniform steel-green, and the latter steel-blue with purple wings and tail, there is a most remarkable difference in the form of the trachea in the males.

The peculiar subcutaneous convoluted tracheas of the closely allied genera *Manucodia* and *Phonygama* have formed subject matter for many interesting papers. Lesson, in the

^{*} Proc. Zool. Soc., 1859, p. 158.

[†] Dict. Bds., pt. ii, p. 554 (1893).

"Voyage of the Coquille," figures *P. keraudreni*, and the convoluted trachea of the male. Professor Pavesi, in the "Annals of the Genoa Museum,"[†] figures and describes the tracheas of several species. As pointed out by the late Mr. W. A. Forbes,[‡] in describing the tracheas of *M. atra* and *P. gouldi*, the specimens figured by Professor Pavesi in his second paper as belonging to *P. keraudreni*, are in reality those of *P. gouldi*, with the exception of figure 6. As there shown, considerable variation exists in the number and disposition of the coils in the tracheas of the males of this species. On these extraordinary convolutions of the trachea, lying beneath the skin and extending on to the pectoral or abdominal muscles, depend to a large extent the loud and prolonged notes of the males of these genera.

Of the tracheas figured below, all show their ventral aspect, the drawings being made from tracings of photographs of them as they lay *in situ* on the bodies of spirit specimens, with the exception of figure 1, which had been removed. The latter, presented by Mr. R. Grant, is the trachea taken by him from a fine old adult male of *Manucodia comrii* that he had received in spirits from Ferguson Island. From the base of the larynx to the lowest portion of the outer convolution, it measures six inches and a quarter; its greatest width transversely one inch and three-quarters. This trachea is more developed than the one belonging to a male of this species figured by Mr. F. E. Beddard in "The Ibis,"[§] for after the two sections that form it run nearly the whole length of the body and turn to the right, as figured by Mr. Beddard, it returns up the body again, the upper part of the terminal loop lying on the pectoral muscles, and the inner side of it almost touching the inner section of the trachea, which, when lying on the body would be about half-way down the keel-bone. As pointed out, however,

by Mr. Beddard and previous writers, in the males of this genus the trachea varies in the extent of its development. This is apparent in the present species, also

in the two figures here shown of the tracheas of *Phonygama gouldi*.

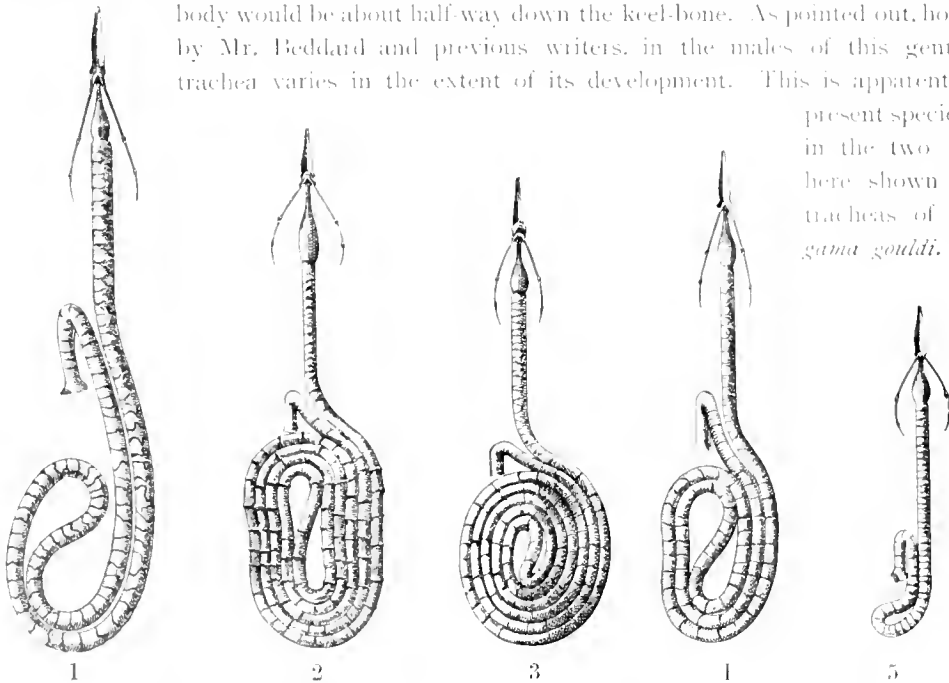


Figure 2 is that of the trachea of a male *Phonygama gouldi* from Cape York, and closely resembles in shape and the number of coils, Pavesi's figure 3 of this species, although there attributed by him to *P. keraudreni*. From the base of the larynx to the lower portion of the

* Voy. de la Coquille, Atlas, pl. xiii., fig. 2 (1826)

† Ann. Mus. Civ. Gen., Vols. vi.-ix. (1874-6).

‡ Proc. Zool. Soc., 1882, p. 347.

§ "The Ibis," 1891, p. 513

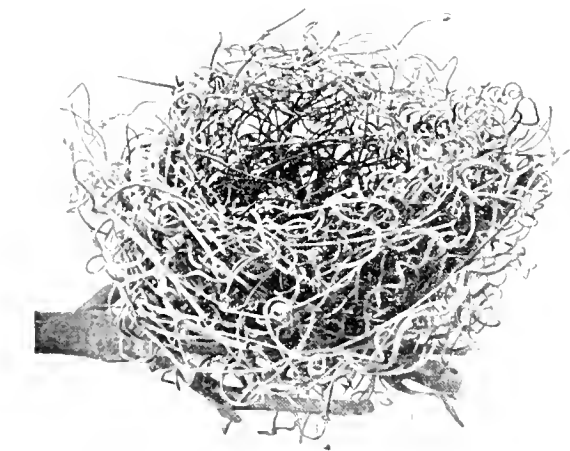
Ann. Mus. Civ. Gen., Vol. ix., p. 69 (1876).

outer convolution, which extends on to the abdominal muscles, it measures in total length five inches and three-quarters, and its greatest width transversely through the centre of the coil is two inches. Figure 3 is also that of a trachea of a male *P. gouldi* from Cape York, and was presented by Mr. R. Grant, who received the bird in spirits shortly after it had been procured. It is similar to Pavesi's figure 1, and measures from the base of the larynx to the lowest part of the outer convolution five inches and a half, and its greatest width transversely through the centre of the coil is two inches and a quarter. Figure 5 is that of the trachea of a semi-adult female of *P. gouldi* from Cape York. It is convoluted, but only to a small extent, consisting of a single loop. From the base of the larynx to the lowest outer portion of the loop it measures in a straight line 3.6 inches. Figure 4 is that of a trachea registered as belonging to a male *P. keraudreni*, from the Laloki River, New Guinea. I have not seen the skin belonging to it, and have therefore no means of verification. From the base of the larynx to the lowest portion of the outer coil it measures four inches and three-quarters, and transversely through the centre of the coil one inch and three-quarters. Lesson's figure¹ of the trachea of this species, which gives the dorsal aspect,

although having the same number of convolutions, is somewhat different in the disposition of the inner loops.

On examining the stomachs belonging to the bodies of figures 2 and 5, I found they contained the stones and seeds of various fruits.

Although there are several species representative of each of the genera *Manucodia* and *Phonygama* in New Guinea, and they are by no means uncommon, more than a century had elapsed since the type of the former genus — *Manucodia chalybeata* — had been described before any knowledge was gained of the nidification and eggs of any species of either of these closely allied genera. Through the exertions, however, of the Rev. R. H. Rickard, I had the pleasure of des-



NEST OF AUSTRALIAN TRUMPET-BIRD

cribing and figuring the egg of *Manucodia comrii*,² which is by far the most lovely species of this genus. The nest Mr. Rickard found in the lower branches of a bread-fruit tree in July, 1891, on Fergusson Island, off the south-east coast of New Guinea. The female was sitting on the nest, which was an open structure formed of vinelets and plant tendrils, and placed at the extremity of a branch. It contained two eggs of a warm isabelline ground colour with purplish dots, blotches, and bold longitudinal streaks evenly dispersed over the surface of the shell, intermingled with similar underlying markings of purplish-grey. Length 1.65 × 1.13 inches. This is a typically marked egg of a Bird of Paradise, resembling that of *Paradisaea raggiana*, in markings, more than any other species.

Through Mr. Kearland, the following note has been kindly sent to me by Mr. Robert L. Jardine, of Somerset:—"Gould's Manucode is generally found in the margins of scrubs, and is

¹ Ann. Mus. Civ. Gen., Vol. ix., p. 68 (1876).

² Voy. de la Coquille, Atlas, pl. xiii., fig. 2 (1826).

³ Rec. Aust. Mus., Vol. ii., p. 32, pl. vii. (1892).

resident here throughout the year. Like *Craspedophora alberti*, it is very restless, and extremely local in habits. Its note, a deep hissing whistle, is difficult to describe, and resembles the sound of 'kheu, kheu,' as closely as letters can. The breeding season commences in December, the nest being built high up in one of the scrub trees, some sixty or seventy feet from the ground. It is a shallow but compact structure, very roughly formed of plant stems and curly vine tendrils, and closely resembles that of *Chibia bracteata*, only larger, measuring from six to seven inches in external diameter. Two eggs are laid for a sitting." Since the receipt of the above note, Mr. Jardine has kindly forwarded a nest taken by him in a *Terminalia muelleri*, at a height of sixty feet from the ground. It is an open cup-shaped structure, formed throughout of dried plant stems and curly vine tendrils, and is lined at the bottom with slightly finer but similar material. Externally it measures six inches in diameter by four inches in depth, and internally four inches in diameter by two inches and a half in depth. The nest, which has a spring-like consistency, resembling a woven spiral wire mattress, is built where two thin horizontal branches cross one another, and is well supported on the sides by several upright leafy branchlets.

For an opportunity of describing a set of eggs of *Phonygama gouldi*, I am indebted to Dr. Charles Ryan, of Melbourne. They were taken at Somerset, and are oval in form, slightly compressed towards the smaller end, the shell being close-grained and its surface smooth and almost lustreless. One specimen has a pale purplish ground colour, over which is uniformly and thickly distributed freckles, dots, and irregular shaped spots of a slightly darker shade of purple, and similar underlying markings of purplish-grey. The other has the ground colour very much paler, rendering the markings more conspicuous, and which are larger and darker on the thicker end. Length (A) 1.44×0.66 inches; (B) 1.43×0.67 inches. Figure 6 on Plate B. III. is taken from a specimen in Dr. Ryan's collection.

Young males are dull blackish above and below; the upper parts, wings, and tail being strongly glossed with purplish-blue, crown of the head purplish-blue; the plumes on the sides of the occiput are much shorter than in the adult, and are distinctly shaded with steel-green, as are also the feathers on the fore neck. Wing 5.6 inches.

Family PTILONORHYNCHIDÆ.

Genus PTILONORHYNCHUS, Kuhl.

Ptilonorhynchus violaceus.

SATIN BOWER-BIRD.

Pyrhocorax violaceus, Vieill., Nouv. Diet. d'Hist. Nat., tom. VI., p. 569 (1816).

Ptilonorhynchus holosericeus, Gould, Bds. Austr., fol. Vol. IV., pl. 10 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 112 (1865).

Ptilonorhynchus violaceus, Sharpe, Cat. Bds. Brit. Mus., Vol. VI., p. 381 (1881).

ADULT MALE.—General colour above and below lustrous purplish-black, the centre of the apical portion of the feathers black, their bases grey, the black centres showing on some of the feathers of the rump and upper tail coverts, and on most of the feathers on the centre of the breast and abdomen; lesser and median wing coverts like the back; greater and primary coverts and inner secondaries black, margined on their apical portion with purplish-black; primaries and outer secondaries black, the latter faintly margined on the outer webs with purplish black; bill bluish-horn colour at the base, passing into pale greenish-yellow at the tip; legs and feet white, tinged with yellow; iris blue, with a circle of red around the pupil. Total length in the flesh 12.5 inches, wing 6.8, tail 4.5; exposed portion of bill 0.9, tarsus 2.

EXPLANATION OF PLATE A. I.



Nest and eggs of COLONEL AUSTRALIS.
Australian Raven.



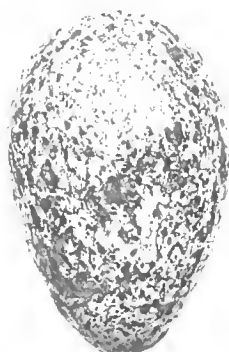
EXPLANATION OF PLATE B. 4.

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- Figs. 1, 2, 3, 4. — *Corone australis*.
Australian Raven.
- Figs. 5, 6. — *Gymnorhina tibicen*.
Black-backed Magpie.
- Figs. 7, 8. — *Corvus coronoides*.
Hazel-eyed Crow.
- Fig. 9. — *Stercoraria arguta*.
Hill Crow Shrike.
- Fig. 10. — *Stercoraria melanoptera*.
Black-winged Crow Shrike.
- Fig. 11. — *Stercoraria fuliginosa*.
Sooty Crow Shrike.
- Fig. 12. — *Stercoraria graculina*.
Pied Crow Shrike.
- Fig. 13. — *Stercoraria cuculicaudata*.
Grey Crow-Shrike.
- Figs. 14, 15, 16. — *Gymnorhina leucosota*.
White-backed Magpie.



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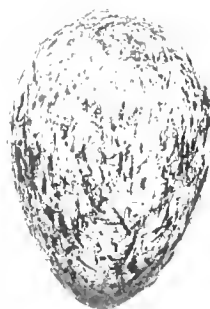
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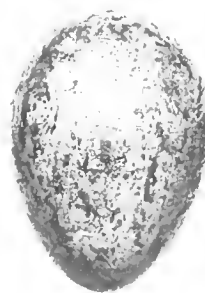
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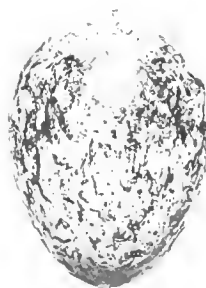
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16

ADULT FEMALE—*General colour above greyish-green, the feathers of the back being slightly tinged with blue on their margins, and those of the rump and upper tail-coverts more distinctly washed with green; lesser and median wing-coverts slightly duller in colour than the back, the greater coverts and inner secondaries dull reddish-brown, washed with greyish-green, the latter and the inner series of the greater coverts with an indistinct whitish tip; primaries and the remainder of the secondaries dark brown on their inner webs, golden-brown on the outer; tail golden-brown, with a reddish shade on the outer webs of the lateral feathers; ear-coverts and cheeks brown, with a faint greenish-grey shade, and having narrow pale buff shaft streaks; throat light brown washed with greenish-grey and having darker edges to the feathers; remainder of the under surface pale yellow washed with bluish-green, all the feathers having a spot in the centre and a broad submarginal edging of blackish-brown, the bluish-green wash being darker on the sides of the body; bill dark brown tinged with olive; legs and feet olive-white; iris deep blue. Total length in the flesh 12.5 inches, wing 6.5, tail 4.6, exposed portion of bill 0.9, tarsus 1.85.*

Distribution.—Eastern Queensland, Eastern New South Wales, Victoria.

WITHOUT exception, the bower-building birds of Australia are the most extraordinary and interesting group of birds found in the world. It is true that many species form beautiful nests for the reception of their eggs, and rearing their young, but in no instance is bird-architecture perfected so much as is seen in the wonderfully constructed play-houses or courting-bowers of the family Ptilonorhynchide. The love of the beautiful is always displayed by these birds in the formation and manner of adornment of their playing-places, from the primitive bower made by the Regent Bower-bird in the northern coastal brushes of New South Wales, to the commodious and aesthetically decorated structure formed by Newton's Bower-bird in the tropical scrubs of the table-lands and mountain peaks of North-eastern Queensland.

The Satin Bower-bird is the commonest species of this interesting family, being distributed throughout the coastal scrubs and contiguous mountain ranges of Eastern and South-eastern Australia, from Rockingham Bay in Queensland to the Otway Forest in Victoria. The whole of the rich coastal brushes of New South Wales, however, may be regarded as the stronghold of this species, localities in which many wild fruit and berry-bearing trees abound, its range extending inland as far as the western slopes of the Blue Mountains. In that coastal belt of palm brush between Ourimbah and Wyong, on the northern side of the Hawkesbury River, these birds are usually plentiful during the late autumn and winter months, congregating in large flocks in company with Cat-birds and Regent Bower-birds to feast upon the abundance of wild fruit and berries. Allowing for their being accompanied by their young, and that it is the third or fourth season before the male acquires its full adult plumage, one cannot help being struck with the large proportion in the sombre livery of the female and young male. I also noted the same fact when in South Gippsland, Victoria, where these birds used to be fairly numerous before the undergrowth had been cleared by selectors or devastating bush-fires.

Wild fruits and berries constitute the greater portion of the food of this species, and it is very partial to the berries of the ink-weed and the stinging-tree, to which diet is added insects of various kinds. During the summer and autumn months the Satin Bower-birds congregate in large flocks in orchards, and commit great havoc in the crops, attacking principally the softer kinds of fruit, such as mulberries, peaches, apricots, bananas, oranges, and mandarins. They also even pick a hole in the rind of lemons to extract the somewhat acid and juicy pulp. Mr. J. A. Boyd informs me that near Eden, these birds do considerable damage when the maize is just formed in the cob.

The usual notes of the male resemble the noise made by small rapidly running cog-wheels, accompanied by a deep hissing sound, this is followed by some very sweet clear notes, or those of other birds are imitated, for they are excellent mimics. This is generally uttered when paying attention to the opposite sex at the bower. With the exception of a harsh note of alarm,

common to both sexes, the female does not call like the male. I have had for some time a fine old male in confinement that was formerly in the possession of Mr. Hugh Thomson for two years prior to his giving it to me, and it still imitates the notes of many species frequenting its previous haunts. This bird was captured while feasting upon mulberries in a garden at Burner, in the Shoalhaven District, on the 26th December, 1866. At that time it was in the parti coloured greenish grey and purplish black plumage of the immature male. Further progress towards maturity was made during the next moult in the following March and April, but its fully adult purplish-black male plumage was not assumed until it had again moulted, twelve months later. In the same locality Mr. Thomson, at the latter end of December, 1866, succeeded in capturing two young ones that were just able to flutter out of a nest, built in an *Acacia*. The female used to visit and feed them constantly while they were kept in a cage in the garden, dropping an insect or a berry sometimes a few feet away, and calling and trying to allure them from their captivity. On placing the cage in a room with the window left open, the female entered and was secured; but although supplied with the same kind of food, she was deaf to the entreaties of her hungry brood, and eventually managed to escape. One of the young ones died, and Mr. Thomson gave me the other, which proved to be a female, and is now about two years old. When the cage of the old male is placed opposite to and almost touching that of the female, the former goes through all the antics of this species usually performed at the bower. As I write, he is with lowered head, puffed out body feathers, and slightly spread wings, paying court to the female, and uttering his peculiar machinery-working-like notes. This is followed by a perfect imitation either of the notes of Lewin's Honey-eater, Pennant's Parakeet, Yellow-tailed Black Cockatoo, Pied Crow-shrike, or Lyre-bird, or the low sweet notes of a flock of *Acanthiza*. He is also a good ventriloquist, and I have often been misled by him, thinking that the notes proceeded from birds in the bush opposite to the house. Frequently they are uttered while he has a stone, feather, flower, or twig in his bill, and he is quietly hopping apparently unconcerned about the cage. The mimicry begins, as a rule, immediately after his own peculiar notes are uttered, and seldom does he imitate the notes of more than one species without ceasing. The notes he mimics to absolute perfection are those of the White-throated Free-creeper, the shrill "pink, pink, pink," being as natural as if the latter bird were caged. He usually calls early in the morning in the spring and summer months, and seldom, unless placed opposite the cage of the female, or before a mirror; in autumn and winter he is almost silent.

Bananas form the principal portion of the food of this pair of birds, alternated with berries of the ink-weed, milk-thistles, cake, and soft biscuits of any kind. They are extremely fond of green peas (which they are adepts in shelling), fruit and thistles, and a turf of freshly-cut sweet green grass. Occasionally their diet is varied with finely chopped meat, or insects; the latter they carefully crush to pieces before attempting to swallow them. The old male is very tame, and will feed out of my hand, but the female is rather shy. Both bathe frequently, especially in the summer months. These birds have very powerful bills, and all objects within reach on the ground, and small enough to enter, are drawn by them into their cages. The female is somewhat mischievous, and delights in taking in her bill a tea-cup full of water, or bread and milk, and turning it over almost as soon as it is placed in the cage. When wishing to be fed, she makes a noise by taking the cup in her bill and dropping it about from one end of the cage to the other.

The peculiar habit of the family Ptilonorhynchidæ in forming bowers or play-grounds was made known by the late Mr. Gould, from an example first brought under his notice in the Australian Museum, Sydney, during his visit to Australia in 1838-9. It was the work of the present species, and was presented to the Trustees by Mr. Charles Coxen, of Brisbane. So interested was Mr. Gould in this structure, that he determined on visiting the haunts of the Satin Bower-bird, and was successful in finding several of their bowers in the brushes of the

Liverpool Range. These were afterwards figured and accurately described by him in his splendid work on the Birds of Australia. The bower, or play-house, is built on the ground, generally in scrub, and placed near a fallen log or moss-covered rock. A space is cleared in the undergrowth from two to three feet in diameter, which is covered with a layer of thin sticks and twigs to a depth of three inches. In the centre of this platform, which is slightly higher and slopes gradually to the sides, two parallel walls formed of thin curved sticks and twigs are built, the base of the walls being thicker and the inner portion of the bower resembling in form an inverted horse-shoe. Great variation exists in the shape and size of these walls. In some the twigs of which they are formed meet or cross one another at the top, forming an arch; others are nearly upright, while not infrequently the top of the walls is wider apart than the base; and in several I have examined the inner portion was concave, narrowing towards either end. The walls at the base measure from ten inches to two feet in length, and are as a rule narrower at the top, twelve to fourteen inches in height, and externally ten to twelve inches in breadth at the entrance. Internally they measure at either end from four to six inches, which gradually widen out in the centre of some, from six to eight inches. Scattered over the platform are loose twigs, and about the entrance of the bower bits of bleached bone, land shells, pieces of moss, berries, and bright feathers, one or more of the latter, and chiefly the rigid wing or tail feathers of Pennant's and the Rose-hill Parrakeets being worked into the sides of the bower. Since the advent of settlers in Australia, any bright or glistening article is used by these birds to ornament their play-grounds. A bower which was tenanted by several birds the greater part of the year, and close to the house where I stayed during my visits to South Gippsland, was, with the exception of a few land shells, entirely decorated by bits of broken crockery and glass. Another, obtained by Mr. A. P. Kemp and Mr. E. R. Waite, in the Dondingalong scrubs sixteen miles from Kempsey, on the Macleay River, had the cast skin of a small snake worked into the front of one of the walls, and was ornamented with a few bits of green moss, dead leaves, and dried sprays of flowers. This is one of the smallest bowers I have seen of this species, measuring only ten inches at the base of the walls, eight inches at the top, and internally three and a half inches at either entrance, widening out to five inches and a half near the centre. It differs, too, in having the platform of twigs on which it is built strewn over with a species of yellow sedge, resembling straw: a female was procured at this structure. A bower found in the damp scrubs near Jenolan Caves, by Mr. J. C. Wiburd, and forwarded by him to the Trustees of the Australian Museum, had among the usual decorations six specimens of a then unnamed and well marked variety of land shell, which Mr. C. Hedley has since distinguished as *Thersites gulosa*, Gould, var. *depressa*.^{*} This bower will be found figured in Dr. Sharpe's "Monograph of the Paradiseidae and Ptilonorhynchida." At these bowers or avenue-like structures, the sexes meet and disport themselves, chasing one another through their play-ground and stopping now and again to alter, or add, some new decoration. The males assume at times some grotesque attitudes. With head lowered, feathers of the neck erect, drooping wings, and tail-feathers expanded, they move about the bower or pay attention to the females, more especially during the pairing season.

The nest is usually built in the fork of a tree, at a height varying from six to forty feet from the ground. Not infrequently it is placed in the upright branches of a *Loranthus*, growing from the top of an horizontal branch:—a favourite site with members of the allied genus *Chlamydodera*. In the coastal districts of New South Wales, the different species of *Casuarina* are chiefly selected as nesting-sites, and occasionally *Acacias*. I knew of one built in an orange-tree, and another in an apple-tree; both being within hand-reach. Inland, on the Blue Mountains, the Prickly Box (*Bursaria spinosa*), is a favourite nesting-site, the spiny dried twigs of this tree being often used in the outer construction of the nest.

^{*} Rec. Aust. Mus., Vol. iv., p. 22, (1901).

The latter is an open saucer-shaped structure, formed externally of long thin twigs and lined inside with dried *Eucalyptus* leaves. Externally it averages eleven inches in diameter by a depth of four inches and a half; internally six inches in diameter by one inch and a half in depth. Two is the usual number of eggs laid for a sitting, three occasionally, and sometimes only one. None of the eggs of the family Ptilonorhynchidæ vary so much in shape, colour, character, and disposition of their markings as those of the Satin Bower-bird. On Plate B. II., Figures 1 and 2, are those I consider fairly typical specimens. One is oval in form and of a rich cream ground colour, uniformly blotched, spotted, and dotted with different shades of umber-brown and similar underlying markings of dull bluish-grey, the texture of the shell being fine and its surface slightly glossy:—Length 1.7×1.2 inches. The other, of not so common a type, is elongate oval, and of a similar ground colour, with large irregular shaped blotches and a few dots of dark umber-brown sparingly and unevenly distributed over the shell, some of the markings having almost an inky hue:—Length 1.8×1.2 inches.



NEST AND EGGS OF SATIN BOWER-BIRD.

These specimens, except for their larger size, closely resemble the eggs of *Oriolus sagittatus*, and are of the usual type found in Gippsland, Victoria. Similar in colour, but varying considerably in the character of the markings, are specimens taken in the Illawarra District of New South Wales. Short wavy irregular lines, and blurred figures like those on some specimens of *Sericulus melinus* take the place of blotches and spots

on the common type:—Length 1.8×1.13 inches. Another egg from the same district has large clouded patches of dull violet and purplish-grey appearing as if beneath the surface of the shell:—Length 1.75×1.1 inches. Two eggs, taken by Mr. A. P. Kemp near West Kempsey, in December, 1896, are of a pale creamy-white ground colour, with a few bold irregular-shaped linear streaks, and spider-shaped markings of dark umber-brown, intermingled with similar underlying markings of bluish-grey, which are confined entirely to the larger end of the shell:—Length (A) 1.72×1.2 inches; (B) 1.8×1.23 inches. Another set is elongate oval in form and very pointed at the smaller end, of a faint cream ground colour, with long, streaky linear, right and acute angled markings, and small blurred patches of umber-brown and similar underlying markings of dull violet-grey:—Length (A) 1.78×1.16 inches; (B) 1.75×1.16 inches. The character of the markings on the latter set resembles that frequently seen on the eggs of *Sterna bergii*.

The nest figured was taken near McEwan Creek, one mile from Jenolan Caves. Two nests were found, one on the 9th, the other on the 18th December, 1898. They were both built in thick lichen-covered forks of *Bursaria spinosa*, about ten feet from the ground, and each contained a single incubated egg.

This species is a late breeder, eggs seldom being obtained before the middle of November, and in some seasons as late as the end of January.

Young males are similar in plumage to the adult female. Immature or parti-coloured males show the adult plumage of the two sexes, but the old greyish-green body feathers are duller in colour than in the adult female. In three semi-adult males now before me all the new purplish-black body feathers, as well as those of the wings and tail, were acquired by a direct moult. Some of the primaries and black tail feathers are only two-thirds of the length of the dull golden-brown remaining feathers. In another specimen exhibiting a further progress towards maturity, the whole of the plumage is purplish-black, except on the rump, thighs, and abdomen; on these parts the full adult plumage is being gradually acquired by a change of colour in the feathers.

Genus CHLAMYDODERA, Gould.

Chlamydodera maculata.

SPOTTED BOWER-BIRD.

Calodera maculata, Gould, Proc. Zool. Soc., 1836, p. 106.

Chlamydera maculata, Gould, Bds. Austr., fol. Vol. IV., pl. 8 (1848).

Chlamydera maculata, Gould, Handbk. Bds. Austr., Vol. I., p. 450 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VI., p. 389 (1881).

ADULT MALE—General colour above dark brown: each feather of the mantle, scapulars, back, rump, and upper tail coverts with a rounded spot of tawny-buff at the tip, some of the feathers of the mantle with lighter edges: wing coverts like the back: primaries brown, externally edged and narrowly tipped with buffy-white: secondaries brown, margined and largely tipped with rich buff, the outer series being also narrowly edged with white near the ends of their shafts: tail feathers brown, edged with light brown and tipped with rich buff which passes into white at the extreme ends of the feathers: feathers of the head and sides of the neck tawny-buff with narrow blackish edges, those on the crown with silvery tips: on the nape a band of beautiful rose-lilac plumes which have a rich opalescent lustre: hind neck amber-brown: cheeks pale buffy-white with brown edges to all the feathers: throat buff, with blackish-brown edges to the feathers: centre of the chest, breast, and abdomen, pale creamy-buff, becoming paler on the sides, which are crossed with dusky brown transverse bars: under tail coverts pale tawny-buff, each feather margined with pale creamy-buff and crossed with two narrow blackish-brown bars: bill blackish brown slightly tinged with olive: legs olive-green, the feet darker: iris brown. Total length in the flesh, 12 inches, wing 5.8, tail 4.25, bill 0.9, tarsus 1.5.

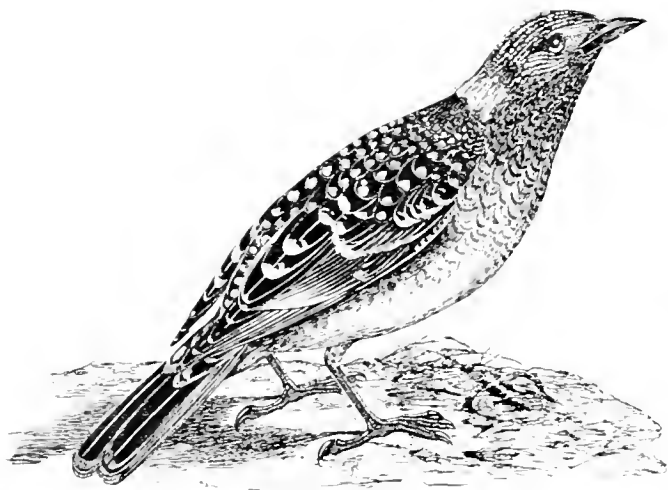
ADULT FEMALE—Similar in plumage to the male, but destitute of the rose-lilac plumes on the nape, which is like the head.

Distribution.—Queensland, New South Wales, Victoria, South Australia.

THE Spotted Bower-bird is essentially an inhabitant of the inland portions of Queensland, New South Wales, and Victoria, its range in the former State extending nearer to the coast, specimens having been obtained by Mr. George Masters at Gayndah in 1863. It is more abundantly distributed in the western and north-western districts of New South Wales, and is equally numerous in the adjoining portions of South-western Queensland. At Sandy Creek, near Cobar, these birds are fairly plentiful; and further west, for the last quarter of a century, Mr. James Ramsay, at Louth, Wilgaroon, and Tyndarie, has

frequently obtained them, also their nests and eggs. South-east of Cobar, the late Mr. K. H. Bennett observed this species throughout the whole of the scrubby arid country lying between the Lachlan and Darling Rivers, its range extending throughout Riverina into North-western Victoria.

In the northern portions of New South Wales, I found it frequenting the scrubs in the neighbourhood of the Namoi and Gwydir Rivers; and doubtless, as in Gould's time, it is still fairly numerous in the undisturbed scrubby ranges I passed by at Breeza to the northward of the Liverpool Plains. At Narrabri, it visits the fruit gardens along the Namoi in small flocks during the autumn months, and its nest and eggs have been taken at Little Mountain, about a mile east of the town. At "Wilga," near Moree, I also observed it in Mr. C. J. McMaster's garden. Mr. McMaster, whose official duties necessitated his periodically visiting Collarenebri and Walgett, informed me that while driving over the intervening wide expanse of country, he observed these birds and their bowers, in nearly every favourable situation.



SPOTTED BOWER-BIRD.

The egg, or rather portion of an egg-shell, found on Ash Island, at the mouth of the Hunter River, in 1864, and formerly attributed by me to this species, is undoubtedly that of the Regent Bower-bird.

Mr. John MacGillivray forwarded, among others, authentic eggs of the Spotted Bower bird, said to have been taken near Grafton, in September, 1864. During my visit to the Clarence River District, in 1898, I was struck with the character of the country and the vegetation from the river's mouth to the head of navigation as being one of the

very last places I should have expected to have met with this species. Mr. George Savidge, of the Upper Clarence, has also favoured me with the following note:—"I have never seen or heard of the Spotted Bower-bird being found on the northern coastal rivers. Some years ago I made a very fair representative collection of the birds frequenting the Clarence and Bellinger River Districts, but I never saw it, or met with any person that had, although I have often made inquiries from those who take an interest in our birds. None of the Clarence River or Orara River natives I have questioned have seen it, and I have been a keen observer of bird-life here for nearly twenty years." Nevertheless it is possible that MacGillivray, who was a careful observer, did obtain the eggs in the neighbourhood, probably during a period of excessive drought inland, when many species are driven to the coastal districts, for of recent years Mr. Savidge has observed and obtained at Copmanhurst, two well-known plain-frequenting species, the Bustard (*Eupodotis australis*), and the Chestnut-eared Finch (*Taniopygia castanotis*), as well as procured the nests and eggs of the latter. I met with the Spotted Bower-bird about one hundred and fifty miles due west of Copmanhurst, but, if it is found at all in the northern coastal districts east of the New England Range, it can only be regarded as a rare or accidental visitor.

* Proc. Linn. Soc. N.S.W., (Second Series), Vol. I., p. 1158 (1886).

Consequent upon Dr. Ramsay's examination of the type of *Chlamydochera occipitalis*, in the British Museum, in 1883, in which he shared the belief previously held by Dr. R. B. Sharpe, that it was only a fine old adult male of *C. maculata*, the range of the latter species was extended to Cape York.¹ The type of *C. occipitalis* was stated by Mr. E. W. Janson, the dealer who sold it to Gould in January, 1872, to have formed part of a collection made by Mr. Jardine at Port Albany, North Australia. I am of the opinion that the bird was obtained in Western New South Wales. If Gould's figure of this species in his "Birds of New Guinea"² is not an exaggerated one, it differs from *C. maculata* in not only having a larger frill on the nape, but in having it surrounded by a blackish-brown band distinctly spotted with white. The latter, however, was probably done by the artist to enhance the distinctive character of the frill, for in Dr. Sharpe's "Monograph of the Paradiseidae and Ptilonorhynchidae" the same figure is used, but this band and its markings are much more subdued in form and colour. I have a specimen now before me, otherwise agreeing with Gould's figure of this species. It is a fine old adult freshly moulted male of *C. maculata*, and was obtained by Mr. James Ramsay, near Louth, in Western New South Wales. Wing, 6 inches.

Mr. J. A. Thorpe informs me that when at Somerset, in 1867, he saw Mr. F. Jardine shoot at a species of *Chlamydochera* that was sitting on a fence near his house, and which eventually fell into some tall grass about a hundred yards away. By a diligent search, the former succeeded in finding the bird which, he states, was a male of the large pink-naped species then known as *C. nuchalis*, but since separated by Gould under the name of *C. orientalis*. Mr. Thorpe obtained another similar specimen in open grassy country about fifteen miles from Cape York. The Spotted Bower-bird (*C. maculata*), or the species described by Gould under the name of *C. occipitalis*, he did not meet with during his seventeen months' residence in the Cape York District. Mr. Bertie L. Jardine also informs me that *C. orientalis* is the only pink-naped Bower-bird that he has met with on the Cape York Peninsula. Personally I have never handled a properly localised specimen of *C. maculata* from further north than Leilavale Station, on the Fullerton River, about thirty miles east of Cloncurry, where, Dr. W. Macgillivray informs me, these birds are not uncommon, and nest during the wet season, January and February, generally in Gidyea scrub. Doubtless its range may extend to the southern portion of the adjoining district of Cook, and of which the Cape York Peninsula forms the northern extremity.

In South Australia, the Spotted Bower-bird is apparently a rare species, and appears to be confined to the Murray River scrubs, a situation similar to that in which it is found in the adjoining portion of North-western Victoria. Neither Dr. A. M. Morgan, nor Mr. A. Zietz, the Assistant-Director of the South Australian Museum, have met with it in South Australia. Replying to an inquiry of mine, Mr. Zietz writes as follows:— "In regard to *Chlamydochera maculata*, we have no specimens from this State in our Museum Collection. All I know about its occurrence in South Australia is the information received from a settler, resident at Morgan, on the Murray River, who with his son was visiting the Museum. On showing them our collection of bird-skins, both recognised at once *C. maculata* as a species known to them as 'Cabbage-birds,' from their destructive habit of eating the leaves of those plants in their kitchen garden, and which these birds were constantly visiting. In looking over some lists for further evidence, I found that six specimens were obtained in the scrub at Overland Corner, on the Murray River, in 1883, by the late Mr. F. W. Andrews, a collector of the South Australian Museum. I myself have never seen any specimens of *C. maculata*, with a statement where they had been collected, except some two dozen skins obtained by the late Mr. James Cockerell, in the Murray River scrubs, near Mildura, Victoria." Mr. Zietz has kindly forwarded me the list of specimens

* Cat. Bds. Brit. Mus., Vol. vi., p. 390 (1881).

† Proc. Linn. Soc. N.S.W., (Second Series), Vol. i., p. 1137 (1886). Tab. List Aust. Bds., p. 11 (1888).

‡ Bds. New Guinea, Vol. i., pl. 45 (1879).

collected by the late Mr. F. W. Andrews at Overland Corner. It consists chiefly of the usual species found in the same situations as the Spotted Bower-bird frequents in the southern limits of its range. Overland Corner is about thirty-five miles in a direct line from the Victorian border, and about one hundred miles from Mildura, in the latter State. There are two unlocalized specimens of *C. maculata* in the Australian Museum collection, obtained by the late Mr. S. White in South Australia.

This species evinces decided preference for open grassy plains, interspersed with low bushes, or belts of timber and scrub. Usually it is met with in pairs or small companies in the neighbourhood of its play-house, when it is extremely shy and difficult to get near, unless, when disturbed, one secretes oneself in the vicinity of the bower and awaits its return. When resorting with its progeny in flocks after the breeding season is over, to the neighbouring orchards or gardens, it is more easily obtained; so also is it during periods of drought, when it will visit stations and farm-houses in search of water.

Mr. R. Grant succeeded in getting many specimens on Glenariff Station, between Coolabah and Byrock, in 1880, principally through a device resorted to by a kangaroo hunter, Mr. Edmund Parker, a native of the district. The latter, knowing that red has a powerful attraction for these birds, although none were at that time seen in the neighbourhood, threw a red flannel blanket he had in his tent over the branch of a Wilga tree. In less than an hour, a male and a female alighted close to the blanket, and began to examine it in their inquisitive manner, when they rapidly fell at the discharge of Mr. Grant's gun; many others, on different parts of the run, were secured in a similar way. Later on, at Buckingham Station, Mr. Grant, while collecting on behalf of the Trustees of the Australian Museum, in June, 1897, succeeded in obtaining several females, young males, and one of their bowers. While there he observed seven fine old adult males in captivity, that had been snared with horse-hair nooses, at the bowers, of which there were thirteen known at that time to be on the run.

The note it utters when disturbed is a harsh and grating one, like that of the Satin Bower-bird, and the introduced Indian Myna (*Acridotheres tristis*); when near its bower, or sitting quietly in a tree, a low plaintive noise is made, like the mewling of a kitten. As is now well known, and was pointed out by me years ago, this bird is an excellent mimic of the notes of other species, and of any sound it may hear. Nevertheless I believe this kitten-like squeal is one of its natural notes, for I have also heard it uttered by a young Satin Bower-bird I have in my possession, that had only left the nest a few weeks before, and had no opportunity, even if it were able, to acquire this feline call. About Moree the male Spotted Bower-bird imitates to perfection the liquid-like notes of the Black-throated Crow-shrike, the shrill call of the Rose-breasted Cockatoo, the plaintive but clear note of the Peaceful Dove, and the whirring-like noise made by the Crested Bronze-wing Pigeon during flight. It is needless to enumerate the different species it successfully mocks, for not only does it imitate the notes of many birds in the vicinity, but the barking of a dog, wood-chopping, the crack of a whip: in fact any sound it may hear that is often repeated.

Wild fruits, berries, and insects, constitute the usual food of this species, but it is very destructive in gardens, eating nearly every kind of cultivated fruit and berries, being especially fond of chilies, and the seeds of the introduced Pepper plant (*Schinus molle*). In the stomachs of the specimens I have examined, I also found portions of unripe tomatoes, grape-skins and seeds, and whole raisins. Others were filled entirely with the heads, legs, and elytra of coleopterous insects. Like the Satin Bower-bird, in confinement this bird will eat almost anything: bread, cake, fruit, meat, insects, etc.

The bowers of this species are built generally near or under the shelter of a bush in the scrub, or in clumps dotted over the plains. In Northern and North-western New South Wales they are frequently constructed under the shade of a Lemon bush (*Canthium olafolium*), or a Currant-bush (*Apophyllum anomalum*), and are occasionally further sheltered above by a wide-spreading wilga, belar, or myall. They are larger, more arched in form and more highly decorated than the bower of *Ptilonorhynchus violaceus*. The two walls, formed of slightly curved twigs stuck upright into a platform of twigs firmly trodden into the ground, frequently meet or cross each other at the top, but more often they are nearly parallel. The walls at the base are thick, and the inner portion, which is usually lined with dried grass-stalks, is nicely rounded at the bottom. At either entrance the bower is profusely decorated with the bleached bones of mammals and birds, land and fresh-water shells, pebbles, pieces of glass, berries, seeds, etc.; in the centre are generally a few stones, berries, shells, or bits of glass. Metallic substances, too, possess a great attraction for these birds, and they will readily enter tents and houses in the more thinly settled districts to procure them. Scissors, knives, plated spoons and forks, thimbles, coins, etc., are frequently pilfered, and carried off to their bowers. At one of their play-houses, on a station near Collarenebri, a brooch was found that had been lost for two years. Galvanised-iron nails and washers, bits of wire, blades of knives, pieces of bright tin, and bottle capsules are common metallic decorations, but of course they vary according to their environment. The size of the playground averages from four and a half feet to six feet in length, and from three to four feet in breadth, the disposition of the decorations materially affecting its length. Bones and glass, which form their chief part, may be scattered around close to either entrance, or deposited in large heaps, sometimes in a straight line at either end of the structure, or in a parallel line with the walls at one end. The walls measure from eighteen to thirty-six inches in length at their base, being as a rule narrower at the top, their average height measuring from ten to fourteen inches.

Unusual shaped bowers are sometimes found. One on Buckingham Station, Mr. Grant informs me, is curved like a boomerang, owing to a branch of the bush under which it is built interfering with the bird's making it straight. Another, found near Cobar, was formed of curved twigs, as usual, which met near the top, and recurving again formed a second bower above, much smaller than the one underneath. The lower bower measured about two feet in length, and the one on top—which was in the centre—one foot. It was decorated with bones, fresh-water shells, and a few of Eley's brass cartridge-cases.

Twigs, with or without a lining of dried grass-stalks, constitute the usual material with which the walls are constructed. During my visits to Northern and North-western New South Wales I found, however, that the walls of the bowers in those parts of the State were more frequently formed entirely of dried grass-stalks. This was first brought under my notice by Mr. C. J. McMaster, then of "Wilga," near Moree, who pointed out to me a bower on Weebollabolla station. It was built near the edge of a belt of timber on the plains, under a large Currant-bush (*Apophyllum anomalum*), overgrown with a creeper known in the district by the aboriginal name of "Nepine," and bearing long spikes of beautiful white flowers, somewhat resembling orange-blossom. The walls were constructed entirely of Spear-grass (*Stipa setacea*), on a slight foundation of very thin twigs. It measured eighteen inches in length, fourteen inches in breadth at the base, and twelve inches across the heads of the grass-stalks; the height of the walls being twelve inches. The run was well trampled down and cleanly swept at either end and around the sides of the bower; and, owing to the disposition of the decorations, which consisted of three neatly made and piled up heaps, was nearly six feet in length. A foot away from the entrance at one end was about a bucket-full of glass; and, at the other, two buckets-full of bleached bones. In a direct line, six inches away from the heap of glass, was another same-sized heap of bones, with which were intermingled a few nuts of the Grouie-tree

(*Oreania acridula*). Just inside the entrance were some siliceous stones, and bits of coloured glass, and in the centre a few freshly picked berries. During my absence from the bower, Mr. McMaster saw one of the birds enter it, but on my shooting in the neighbourhood it flew away. A bower with similar walls was constructed under a large orange-tree in Mr. McMaster's orchard during August and September of 1898. Four birds frequented the place, but it was impossible to tell how many assisted in the construction of the bower. The decorations consisted principally of small pebbles, with which were intermingled a few bits of white and dark red flannel picked up near the house. Mrs. McMaster informed me that on Millie Station, midway between Narrabri and Moree, she introduced some buttons and marbles among the decorations of one of these play-houses, but they were speedily removed by the birds, several of them being found afterwards on different parts of the run. I have heard of bright coins and other articles, placed in the bowers, being rejected in a similar manner.

Many interesting evolutions are performed in and around these bowers, more particularly by the males. Standing on tip-toes, with lowered head and the pink bill on the nape erect, the male will run, sometimes sideways, through and around the bower, stopping perhaps to alter a decoration, or to throw up his wing, or lie down on his side. Running with drooping wings and tail is probably the cause why many of the birds of this family are found with the feathers of those parts so much abraded.

The bower figured, which is a fairly typical one, was obtained by Mr. R. Grant at Buckingham Station. The decorations consist of bones, bits of glass, glass stoppers, seed cones and pods, berries, nuts, shells of the large fresh water mussel (*Unio acuminatus*) and of a fresh-water snail (*Planorbis rotundifolius*). The walls at the base measure twenty four inches in length; at the top twenty inches, with an average height of eleven inches. Width at entrance, eighteen inches; thickness of walls at base, four inches and a half; distance between the walls inside, nine inches.

Mr. A. S. Read, of New Angledool, writes me as follows, under date February 16th, 1899: "The Spotted Bower birds, or 'Weetah,' as they are called by the aborigines in this district, are very wary if they know that you are watching them, or wish to approach near them by stealth; otherwise, when feeding on fruit or playing about their bower, they will come within a few feet and carefully examine the buttons on one's clothes. They are very fond of figs and grapes, also pepper seeds. Some Chinese who have a garden near here, shot about twenty of these birds last month as they were eating all their fruit. Frequently one of these birds will sit in a thick shady tree, and imitate any bird or sound it hears, crows, hawks, dogs, cats, etc., to perfection. In very dry seasons, as in 1898, the Spotted Bower-birds rarely breed at all."

Later on, Mr. Read forwarded to the Museum three males in the flesh which he had shot on the 16th June, and writes: "The bower of these birds is about four hundred yards from my house. The walls of it are formed of long thin twigs, and there is a large heap of bones all of the same shape (probably vertebra of sheep) at one end, and a similar heap of glass at the other, with a few nuts and berries in the centre of the bower. There were four birds playing in the bower this morning, and it grieved me to shoot those I have sent you. It is a pretty sight to see them tossing pieces of glass about and performing all sorts of antics." Two of the males are in beautiful plumage, with very fine and well developed rose-pink nuchal plumes, and are now mounted in the Group collection. The other specimen has only a small square patch of rose-pink feathers in the centre of the nape, measuring 0·7 inch.

The nest of this species is an open and nearly flat structure, having only a slight depression in the centre. It is formed of dried twigs, loosely interlaced, and has a slight lining of finer twigs, to which are sometimes added a few dried grass-stalks. Usually it is very scantily built, and when occupied the eggs or young are visible through the bottom of the nest. An average

nest measures externally seven inches in diameter by two inches and a half in depth. The nesting-sites usually selected are on horizontal branches, sometimes in a *Loranthus* growing from the upper side, or where a few thin upright leafy branchlets spring out; the crown of a low densely foliated tree; and in thick bushes. In Northern and North-western New South Wales, they are usually found in the different species of eucalypti, leopard-trees, myalls, wilgas, pines, and in the prickly "Wait-a-while," or Orange-bush (*Capparis mitchelli*).

The eggs are usually two, sometimes three in number, and, like those of all the species of this genus, are remarkable for the beauty of their markings. In shape they vary from oval to elongate-oval, and in ground colour from a very delicate greenish-grey to dull ochraceous-green, which is more or less covered with wavy irregular thread-like and zig-zag lines of umber and blackish-brown wound round and round the shell, intermingled with loops, scrolls, figures, and a few bold, thick wavy streaks of a darker hue, and similar fine underlying markings, varying from dull violet to purplish-grey. Some specimens have the



BOWER OF SPOTTED BOWER-BIRD.

linear markings very distinct, appearing as if they had been placed on the shell with a pen dipped in colours of various hues; others have underlying clouded blotches of faint violet-grey, and the markings on the outer surface consisting of thick, short, zig-zag, or wavy blurred streaks. Some eggs have the markings uniformly and evenly distributed over the surface, others have them confined principally to the larger end. Nearly all have a few bolder ink-like streaks or spots on some part of the shell. In a specimen now before me, the linear markings are all blackish-brown, and overlie on the larger end a distinct cap formed of coalesced pale umber-brown blotches. Another has the surface markings very faint and uniformly distributed over the shell in a network of delicate tracery. Three eggs from different sets measure as follows: Length (A) 1.55 x 1.03 inches; (B) 1.65 x 1.08 inches; (C) 1.58 x 1.1 inches. Two sets of two measure respectively: (A) 1.55 x 1.1 inches; (B) 1.55 x 1.09 inches; (A) 1.5 x 1.07 inches; (B) 1.52 x 1.07 inches.

A remarkably handsome egg of a set of two in Mr. Joseph Gabriel's collection, is of a very delicate greenish-grey ground colour, boldly marked on the larger half of the shell with irregular linear markings, loops, and scrolls of umber-brown and black, interwoven near the centre with fine black hair lines and similar underlying markings of purplish-grey; the smaller end, with the exception of a few straggling but conspicuous linear streaks of umber-brown and a single purplish-black spot, being devoid of markings. Length: 1.56 x 1.08 inches. Figure 4, Plate B. II., is from Mr. G. Savidge's collection, and Figure 5 from Mr. J. Gabriel's collection.

October, and the three following months, constitute the usual breeding season of this species in South-eastern Australia. It is probable that the young males, which are at first similar in plumage to the adult female, do not wholly attain the rose-pink frill on the nape until the second season. In June, the adult males are in beautiful plumage, and have the frill well developed. Several young males in the collection obtained during that month at Duckiinguy, have no indication of the frill; another has only four rose-pink feathers on the nape. A young male shot at New Angledool in the same month, together with several very fine adult and fully plumaged males, has only a small square patch of rose-pink feathers on the centre of the nape. Evidently these are young males of the previous season. The description and figure given of the adult male is that of a newly moulted bird. Just prior to the moult the spots on the upper parts and the tips of the primaries, secondaries, and tail feathers, are much paler, and have a washed-out appearance. A specimen in the moult, now before me, exhibits the old feathers on the upper parts with buffy-white spots, and the new ones with rich tawny-buff spots near the ends of the feathers. The basal half of the occipital plumes of some adult males is distinctly tinged with reddish-orange.

Chlamydodera guttata.

GUTTATED BOWER-BIRD

Chlamydodera guttata, Gould, Proc. Zool. Soc., 1862, p. 162; *id.*, Bds. Austr., fol., Suppl., pl. 35 (1863).

Chlamydodera guttata, Gould, Handbk. Bds. Austr., Vol. I., p. 153 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VI., p. 390 (1881); North, Viet. Nat., Vol. XVI., p. 9 (1899).

ADULT MALE—*General colour above blackish-brown, each feather of the mantle, scapulars, back, rump, and upper tail-coverts with a rounded spot of rich creamy-buff at the tip; the lesser wing-coverts like the back; the median and greater coverts blackish-brown, with rich yellowish buff tips, the latter also margined on their outer webs with the same colour; primaries and secondaries brown, externally edged and all but the outer series of the primaries tipped with pale yellowish-buff; tail feathers dark brown, edged with buffy-brown, and tipped with rich buff, which gradually passes into buffy-white on the lateral feathers; head blackish brown, all the feathers with a small rounded spot of tawny buff near the end and tipped with silvery-white; on the nape a band of beautiful rose-lilac plumes with a silvery lustre; sides of the neck and hind-neck blackish-brown, with a small rounded spot of rich yellowish-buff at the end of each feather; throat blackish-brown centred with yellowish buff on the apical portion of the feathers; remainder of the under surface creamy-buff, washed with rich buffy-brown on the sides of the body; under tail-coverts creamy buff, the basal portion of some of the feathers having blackish-brown cross-bars; bill black, tinged with olive; legs olive-green; feet darker, nearly black. Total length 10 inches, wing 5.7, tail 3.8, bill 0.88, tarsus 1.5.*

ADULT FEMALE—*Similar in plumage to the male; but the nape, which is like the head, is destitute of the silvery rose-lilac nuchal plumes.*

Distribution.—Western Australia, Central Australia.

THIS very distinct species was described by Gould in 1862, from a specimen received from Mr. F. T. Gregory, the well-known Northern and Western Australian explorer. Gould does not give the locality or district where it was obtained, but states that it was collected in North-western Australia. I have searched through the journals of the various expeditions undertaken by the Gregory Brothers in Northern and Western Australia, but can find no reference to the specimen or the locality in which it was procured. During the journey of the Elder Exploring Expedition, in 1891-92, Mr. R. Helms obtained three males in the Barrow Range. Since the discovery of the type, this is the only occasion I have known the species to have been obtained in any part of Western Australia. Gould stated it was doubtless this species which constructed the bowers met with by the late Sir George Grey in the sandstone ranges forming the watershed of the streams flowing into the Glenelg and Prince Regent's Rivers. I am certain, however, that Gould's first conjecture that the bowers frequently observed by Grey in this district were formed by *Chlamydodera nuchalis*, is the correct one.* The latter species is common in the coastal districts of North-western Australia, and from collections formed inland, from King Sound and Cambridge Gulf, is, I know, abundantly distributed in that neighbourhood. The original specimen of *C. guttata* was doubtless collected during Mr. F. T. Gregory's expedition to the North-west coast in 1861. He did not proceed further north than the Oakover River, a district rich in its avifauna, and in which several Central Australian forms are found. The Barrow Range, where Mr. Helms obtained his specimens, is not a great distance from the South Australian border; and in similar arid country, a little further north and east in South Australia, this species was again met with, and specimens procured at Glen Edith, by the members of the Horn Scientific Expedition in Central Australia in 1894. Since the return of the Expedition, I have seen several specimens from different parts of Central Australia; and from the subjoined notes of Mr. G. A. Keartland and Mr. C. E. Cowle, it will be seen that the central portion of the continent is the great stronghold of this species.

Mr. G. A. Keartland writes to me:—"During the journey of the Horn Scientific Expedition in Central Australia, we met with the Guttated Bower-bird wherever the native fig-trees existed, from Alice Springs in the north to Stevenson's Creek in the south. They are very shy, and although their notes were frequently heard amongst the foliage of the fig-trees, they kept well out of sight, only two specimens being obtained at Glen Edith. These birds make the peculiar single note familiar in other members of the genus, especially in *C. nuchalis*. It is exactly like a noise I have heard opossums make,—half cry, half hiss. Their food consists principally of the fruits of the different species of *Ficus*, and other trees, alternated occasionally with the viscid berries of the *Loranthus*. They are also very troublesome in the gardens of the settlers, owing to their love of tomatoes and young vegetables, which they devour as soon as they appear above the ground. Although usually these birds are very shy, at Owen Springs we were informed that during periods of drought they would come to the water-buckets under the verandah to drink, and become quite fearless of the presence of persons sitting close by. The bowers of this species are usually built near, or under the shelter of a low spreading bush so as to escape the rays of a tropical sun. Several I saw were about three feet from end to end of the run, eight or nine inches wide between the walls, and the latter ten inches high and formed of bits of twigs and grass placed so that the tops of the sides met overhead. All over the floor of the bower, and for a space about two feet at either end were strewn bleached bones, bits of glass, and feathers."

Mr. C. E. Cowle, who, in the prosecution of his official duties in different parts of Central Australia, has had unusual facilities for studying the habits of these birds, has also kindly

* Trans. Roy. Soc. South Austr., Vol. xvi., p. 157 (1893).

† Grey—Travels in North-west and Western Australia, Vol. i., p. 245 (1841).

favoured me with the following notes:—"There are numbers of Guttated Bower-birds in most parts of Central Australia I have visited. Those close to Illamurta are very destructive in the garden, eating principally the tomatoes, and have become very cunning. One can hear them squealing and chattering at the spring, but on approaching it they are silent, and remain so until one leaves the spot. Two were shot by one of the boys stopping in a 'wurley' we made there for that purpose. They are great mimics, and imitate the notes of *Pomatostomus superciliosus* and other birds very closely. The bowers are formed of small twigs and cane grass, built upon a platform of the same materials, five or six inches in depth, and trodden perfectly flat. Those I have seen when travelling were decorated chiefly with land-shells, pieces of bone, different berries according to the season, and a few bright coloured feathers."

Mr. Cowle has sent me a sketch of an unusually large and most remarkably formed bower. It is nearly seven feet in length, and in the centre on one side of it, at right angles, has another similar structure, three feet in length, opening into the main avenue or run. He writes:—"When we first came here, this bower about one hundred yards from the spring was a meeting-place for the Bower-birds; now it is deserted, and only the remains of it are left. It is situated in mallee scrub at the foot of a myrtle-bush, whose low spreading sticks with many leafy branchlets practically cover the entire structure. The shape is like enclosed sketch, with the runs gradually sloped from the three entrances to the centre, which is slightly more elevated than the remainder. The walls are made of small twigs and cane grass, the run between being irregular and varying from ten inches to a foot in width. When occupied by the birds the decorations varied a lot, but consisted chiefly of bleached snail-shells (generally plentiful under big tussocks of *Triodia mitchelli*), and small bones of mammals and birds. The entrances to the runs were spread over with berries of the Fig (*Ficus polyfoda*), Native Quandong (*Santalum lanceolatum*), and of a species of whitewood. Later on, after our advent, pieces of glass, odd nails, and bits of bright tin, were intermingled with the other ornaments. Sometimes the shells and berries would be arranged along the runs or on the sides of them. The traffic of the stock, however, going in and out of the scrub, hunted the birds away, and I have not seen any other bower near here."

Mr. Kearland informs me that he saw this remarkable structure when in Central Australia with the Horn Scientific Expedition in 1864.

Ever since the return of this Expedition, Mr. Kearland urged his many friends in Central Australia to try and discover the nest and eggs of this species. Bearing on this subject are the following interesting notes received by him from Mr. Cowle:—"Relative to *Chlamydodera guttata*, I do not for one moment think that the blacks have any objection to finding and robbing these birds' nests, for they must have slaughtered over twenty Bower-birds here for me about the garden; one of the older blacks, who would be more likely to be careful, got five in one day. I believe I found one of their nests during our last trip. We were having dinner on the 28th October, 1868, in one of the valleys south of Mareena Bluff, and got a young Bower-bird just able to fly. It was in one of those scrubby mulgas that throw out so many branches right from the ground. Near the top of this tree, in a clump of silvery-whitish mistletoe, which you must often have noticed up here—not the drooping viscid-leaved one—was an open nest which contained minute fragments of egg-shell and dried up yolk, which convinced me at least that one egg had been broken. The nest was constructed of a few dry black cotton-bush tops and was loosely lined with coarse dried grass-stalks. Externally it measured eight inches in diameter, and internally about four inches and a half. Viewed from below, the nest would be taken for an unfinished one not worthy of inspection, and I was particularly struck by the amount of ventilation in it when I had it in my hand. The black-boys who were with me were certain it was a Bower-bird's, but I was doubtful if they had seen one before."

Mr. James F. Field eventually succeeded in finding a nest with eggs during the first week in February, 1899, near Alice Springs Telegraph Station. It was similar to the one described above by Mr. Cowle, but was built in a low bush, and contained two eggs. One egg was sent to Mr. Kearland, and by him kindly lent to me for description. This egg, the only one I have seen belonging to this species, is elongate-oval in form, of a faint greenish-grey ground colour, with the usual labyrinthine net-work of zig-zag wavy hair and thread-like loop-lines, scrolls, and figures, crossing and re-crossing each other, so characteristic of typical eggs of the *Chlamydodera*. In this specimen there are but very few underlying markings, nearly all of them being well defined, and appearing as if they had been placed on the shell with a pen dipped into different shades of umber-brown and violet-grey, the former colour predominating and being more thickly disposed towards the thinner end, where in some places the lines are confluent and form broad irregular-shaped patches, and short wavy streaks. The shell is close-grained and its surface smooth and lustreless:—Length 1.56 × 1.02 inches. In shape, size, colour, and disposition of its markings, it cannot be distinguished from fairly typical eggs of its near ally *C. maculata*. This egg is represented on Plate B. II., Figure 7.

Chlamydodera nuchalis.

GREAT BOWER-BIRD.

Ptilonorhynchus nuchalis, Jard. & Selby, Ill. Orn., Vol. II., pl. 103 (1830).

Chlamydodera nuchalis, Gould, Bds. Austr., fol., Vol. IV., pl. 9 (1848).

Chlamydodera nuchalis, Gould, Handbk. Bds. Austr., Vol. I., p. 448 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VI., p. 391 (1881).

ADULT MALE—General colour above dark brown: the feathers of the back, scapulars, rump, and upper tail coverts broadly margined with ashy-brown, and those of the mantle gradually passing into dull ashy-brown at the tips: upper wing coverts like the back: primaries and secondaries dark brown, externally edged, and all but the outer series of the primaries tipped with ashy-white: head and hind neck uniform ashy-brown: on the nape a band of rose-lilac plumes, the feathers surrounding it being tipped with silvery-white: sides of the head, neck, and throat, ashy-brown: remainder of the under surface ashy-brown, with a slightly creamy tinge, which is more distinct on the centre of the abdomen: under tail coverts dull creamy-white, with narrow dusky-brown cross-bars: bill blackish-brown: legs and feet dark brown tinged with olive: iris brown. Total length 14 inches, wing 7, tail 5.6, bill 1.15, tarsus 1.8.

ADULT FEMALE—Similar in plumage to the adult male, but without any rose-lilac band on the nape, which is ashy-brown like the head.

Distribution.—Northern Territory of South Australia, North-western Australia.

THE Great Bower-bird was originally described and figured by Jardine and Selby in their "Illustrations of Ornithology," as *Ptilonorhynchus nuchalis*, but as in other Australian species described and figured by those gentlemen on the two preceding plates, no reference is made to the part of the continent in which the types were obtained. Dr. Ramsay, in his "Tabular List of Australian Birds," states:—"The type of *Chlamydodera nuchalis* was first found in North-western Australia, probably during Leichhardt's Expedition, by Gilbert: or by Elsey near Port Essington." Leichhardt's overland expedition, however, which Gilbert accompanied, and where he met his death, did not start from Brisbane until 1844, and this species was well known to Mr. Elsey, who was surgeon and naturalist to Mr. A. C. Gregory's North Australian Expedition in 1856. Writing to the late Mr. Gould from the depot at the Victoria River, in June, 1856, he states:—"I met with two or three nests—bowers—of the Bower-bird, *C. nuchalis*,

but no one of my party has seen the birds." The expeditions these two gentlemen accompanied, it will be observed, were made many years after the types of *C. nuchalis* were described.

In their description of *Halcyon macleayi*, which is the next but one preceding that of *Chlamydodera nuchalis*, Messrs. Jardine and Selby afford a clue from whom the types of the latter species were obtained. They write: "This beautiful species (*H. macleayi*), with some of the subjects on our following plates, have lately been added to the collection of the Linnean Society by the zeal and industry of Alexander Macleay, Esq., who though advanced in years, and far distant, remains still indefatigable in promoting the welfare of the Society where he so long and faithfully performed the duties of Secretary." It may not be out of place to mention that the late Hon. Alexander Macleay, F.R.S., F.L.S., was selected by the Earl of Bathurst to proceed to New South Wales as Colonial Secretary in 1825. He was devotedly attached to Science, and was a member of the Committee of the Australian Museum from its first commencement in 1836 until the time of his decease in 1848.

Consequent upon the discoveries made during the late Sir George Grey's journey in North-western Australia in 1838, and the survey and exploration of the coast of Northern and North-western Australia by Captain Lord Stokes, in H.M.S. "Beagle" in the same year, the fact was ultimately established that this species is an inhabitant of the Northern and North-western portions of the Australian Continent.

Modern research has proved that it is apparently distributed throughout all the coastal districts of North-western and part of Northern Australia. Collecting on behalf of the Trustees of the Australian Museum, Mr. Alexander Morton procured specimens at Yam Creek, near Port Essington; the late Mr. Edward Spalding also obtained it near Port Darwin; and recently Mr. E. Olive secured its nests and eggs on the Katherine River. At Cambridge Gulf, M. Octave Le Bon succeeded in netting live birds. Lower down the coast, at Derby, the late Mr. T. H. Bowyer-Bower, in 1880, obtained several specimens. Inland from this place, at the junction of the Fitzroy and Margaret Rivers, Mr. G. A. Kearland, while a member of the Calvert Exploring Expedition in 1896-7, also secured this species; and from the Western Australian Museum, Perth, specimens have lately been received that were obtained at Broome, Roebuck Bay, the farthest south it has yet been recorded.

Mr. Kearland, who met with this species in North-western Australia, writes to me:—"The peculiar notes of the Great Bower-bird were heard along the Fitzroy River, from Derby to the Margaret River. Soon after reaching the former river, in November, I secured a young one, and on mentioning the matter to several gentlemen at the camp, they informed me that a pair had been taken from a nest by a black boy a few weeks previously. This species is very fond of bathing, and will roll in the water until its feathers are thoroughly soaked: most of the specimens were obtained at the horse-trough near the well, where they came frequently to drink and bathe. They are very tame, and easily shot. Their chief food is the small black native fig, so common in North-western Australia. These birds are seldom seen in company except at their bowers or play-houses, which are formed by spreading a layer of fine twigs for a space of about three feet across which two parallel walls of twigs are constructed with their tops meeting so as to form an avenue. The walls of one I measured were three feet in length by fifteen inches in height. Through this bower, and all around the structure, large quantities of bleached bones, pieces of glass, quartz, tin, and bright coloured feathers are scattered. The bowers are usually formed under the shelter of spreading bushes, but near the Margaret River one I saw was constructed inside an old native wurley. Dr. A. M. House, who has taken photographs of the bowers, writes: 'My black-boy, who is more intelligent than most natives, says these birds lay about October, and that the nests are built in a *Bauhinia*, and sometimes in a *Melaleuca*.' This bears out what Mr. Blyth told me, who said that some time ago he saw the Bower-bird on its nest in a *Bauhinia* tree near the racecourse."

Subsequently Mr. Kearthland informed me that four nests were found by Mr. J. P. Rogers in the gorges of the Grant Ranges, near Upper Lyveringa Station, but only one contained an egg. This nest was built in a *Bauhinia* tree, about a foot from the ground. Another nest, found by Mr. E. J. Harris on the 6th November, 1900, near Nobby's Well, Fitzroy River, was also built in a *Bauhinia* tree, at a height of six feet from the ground, and contained a single egg, which is now in Mr. Kearthland's collection. The breeding-time, it has since been ascertained, depends upon the season—being influenced by the rainfall; nests having been found from September to December.

Regarding this species, Mr. E. Olive has kindly supplied me with the following notes:—“*Chlamydodera nuchalis* is plentiful in the neighbourhood of the Katherine River, in the Northern Territory of South Australia. I have seen between twenty and thirty feeding in a tree at the same time. They are shy yet inquisitive, and often would they hop on the ground or branches to within a yard or two of me if I kept quiet. Generally their bowers are built



BOWER OF GREAT BOWER-BIRD.

under the shade of trees, or under small shrubs, out in the open, and near dead timber. At one place where these birds were common there were seven bowers within a space of fifty yards square, and one getting built which I watched from start to finish. Of the eight, there were only three of them in use; the others were old, although they looked as good as the new ones. The foundation of the new bower was made of sticks laid on the ground almost parallel to one another, to the thickness of about an inch, and then the sticks to form the walls of the bower were inserted in the crevices. The outer measurements of this bower were, roughly, eighteen inches in length and fourteen inches in breadth; across the inside it measured six inches at its widest part. The decorations were quartz crystals, land shells, and fruit. At another bower I found a revolver-cartridge, with a bullet in it, and some pieces of broken insulator caps. I carefully looked among the articles collected for nuggets of gold, as the birds would pick them up if there were any about. One bower was arched right over, being different to any I have ever seen.

The nests are very roughly formed open structures, built throughout of twigs, averaging from about three to six inches in length, without any other lining. One I took the measurement of, was eight inches in external diameter by five inches in depth; internally four inches in diameter by two inches in depth. This nest was built in the fork of a tree, fifteen feet from the ground. The tree had a bushy top, which was about two feet above the nest; and underneath the structure was a lot of dead branches, making the nest hardly discernible. I might not have noticed it, only that I saw a bird fly from that direction when I was about one hundred yards off the tree. Other nests were built in mistletoes, thick bushy branches, and in similar places where they could be concealed. The nests were all built in small trees in ridgy country at an height varying from eight to twenty feet from the ground. The birds always left the nests long before I could approach them, and would not return until I was out of sight. I never found more than one egg in a nest, and never found a nest near a bower."

An egg of this species, taken by Mr. E. Olive, on the 16th October, 1868, near the Katherine River, an affluent of the Daly River, in the Northern Territory of South Australia, has been kindly lent me by Dr. Charles Ryan, of Melbourne. It is in form a swollen oval, the shell being close-grained and its surface slightly lustrous, and is of a pale greenish-grey ground colour, uniformly marked with irregular lines, streaks, and dashes of umber-brown, which coalesce in some places, forming confluent patches, with which are intermingled a few prominent curved, zig-zag, and fine blackish hair-lines and similar distinct purplish-black underlying markings predominating chiefly on the larger end: Length 1.06 x 1.2 inches. This specimen is represented on Plate B. II., Figure 3. Another egg, taken by Mr. Olive, in the collection of Dr. Charles Snowball, of Melbourne, is more elongate in form, and the linear markings are much darker.

The egg previously referred to, taken by Mr. L. J. Harris in North western Australia, and kindly lent me for description by Mr. Kearthland, is elongate oval in form, and of a pale greenish-grey ground colour, which is covered with a labyrinth of bold and well defined wavy and zig-zag linear markings, scrolls, and hair-lines of dark umber intermingled with a few broader underlying wavy streaks and lines of dull inky-grey, the markings predominating slightly on the larger end, and forming in some places an irregular shaped dark spot or blotch: Length 1.08 x 1.11 inches.

I have now before me the eggs of five species of *Chlamydodera*. In general character of the disposition and colour of the markings the eggs of all are alike, and vary chiefly in size, *C. maculata*, *C. guttata*, and *C. cerviniventris*, being indistinguishable from one another. The eggs of the larger north-western and north-eastern forms, *C. nuchalis* and *C. orientalis*, as might be expected, also closely resemble each other.

Young birds are paler than the adults, and have smaller white, instead of ashy-brown tips to the feathers of the upper parts: the scapulars and secondaries have also a subterminal spot of white as well as a white tip, and the centre of the breast and the abdomen have indistinct dusky-brown cross-bars.

For an opportunity of figuring the bower of this species I am indebted to Dr. A. M. House, who at the loss of much time took the photograph from which it is reproduced and sent it to Mr. Kearthland, with the following notes:—"I am sending you a photograph of the bower of *Chlamydodera nuchalis*. I went one hundred miles up the country to get it, and found this one at the foot of the Barrier Range, north of the Fitzroy River, North-western Australia. It is right up under the shadow of the rocks, and the photograph was taken without cutting away anything. There was a fine heap of odds and ends at each end, the largest collection I have ever seen. You will notice that there are snail shells and bones showing, and inside the bower was a large collection of round hard seeds of a dark green colour, about the size of marbles, with one or two just outside at the entrance."

As will be seen by the accompanying illustration, the bower is entirely arched over at the top, and similar to one observed by Mr. Olive near the Katherine River.

Chlamydodera orientalis.

EASTERN BOWER-BIRD.

Chlamydodera orientalis, Gould, Ann. & Mag. Nat. Hist., Ser. 5, Vol. IV., p. 74 (1879); *id.*, Bds. New Guin., Vol. I., pl. 14 (1880); Sharpe, Cat. Bds. Brit. Mus., Vol. VI., p. 392 (1881); North, Viet. Nat., Vol. XII., p. 104 (1895).

ADULT MALE—General colour above dark brown, the feathers of the mantle, back, scapulars, rump, and upper tail-coverts margined with ashy-white; primaries and secondaries dark brown, externally edged with ashy white, and tipped with white, the tips being larger and more conspicuous on the inner secondaries; tail feathers dark brown, becoming blackish-brown towards the tips which are dull white, the central pair being edged with ashy-brown and which decreases in extent towards the lateral feathers; forehead and crown of the head blackish-brown, all the feathers tipped with silvery white, these silvery-white tips extending out on to the feathers of the sides of the nape, and partially surrounding a band of beautiful rose-lilac plumes; hind-neck ashy-brown; lores, a line of feathers above the eye, sides of the head, neck, and throat ashy-brown; remainder of the under surface ashy-brown with a slightly creamy tinge which is more distinct on the centre of the abdomen; under tail coverts dull creamy-white, with narrow dusky-brown cross-bars; bill dark brown; legs and feet dark brown, tinged with olive; iris brown. Total length 12.5 inches, wing 6.7, tail 5.3, bill 1.15, tarsus 1.8.

ADULT FEMALE—Similar in plumage to the adult male, but without any rose-lilac plumes on the nape, which is ashy-brown, with silvery tips to the feathers, like the head.

Distribution.—Northern and North-eastern Queensland.

THIS species was separated by Gould, in 1879, from *Chlamydodera nuchalis* of the north-western coast, on account of having whitish tips to the feathers of the head, and broader margins and tips to most of the feathers on the upper surface, giving it a mottled appearance. These distinguishing characteristics are easily discernible when the two forms are compared. According to the Hon. Walter Rothschild, however, *C. orientalis* is not separable from *C. nuchalis*, and does not merit even subspecific rank. Although Mr. Rothschild has seen in the British Museum "examples of both forms, together with a specimen almost intermediate, all from one and the same locality," I cannot agree with that writer's conclusions. Immature specimens of both sexes of *C. orientalis*, in the collection from Port Denison, and Kuranda near Cairns, combine the characters of both species in having only the feathers in the centre of the forehead and crown of the head distinctly tipped with white, and sides of the forehead and sides of the head almost uniformly ashy-brown. In the large series of these birds now before me, the distinguishing characters of *C. orientalis*, pointed out by Gould, are constant in adult birds, and although undoubtedly both species are closely allied, I cannot but regard *C. orientalis* as distinct and the representative of *C. nuchalis* in North-eastern Australia.

In Dr. Ramsay's "Tabular List of Australian Birds," the geographical distribution of this species is recorded as "Port Denison," from specimens collected there by Mr. George Masters in June, 1863, and "Rockingham Bay" from examples in the Dobroyde Collection obtained some distance inland from Cardwell. Since the publication of that work, however, in 1888, our knowledge of the range of this species has been considerably extended, for we have now specimens in the Reference Collection procured by Mr. J. Clarke in the open country on the

western side of the Sea-view Range; by Mr. J. Beveridge, at Croydon; and by Mr. K. Broadbent, at Normanton. Mr. Bertie L. Jardine also informs me that it is a permanent resident in the neighbourhood of the Ducie River, which is about one hundred and forty miles down the western side of the Cape York Peninsula. I have never seen any *Chlamydodera* from the western shores of the Gulf of Carpentaria, and it would be interesting to learn where the north-eastern and north-western races of the Great Bower-bird meet.

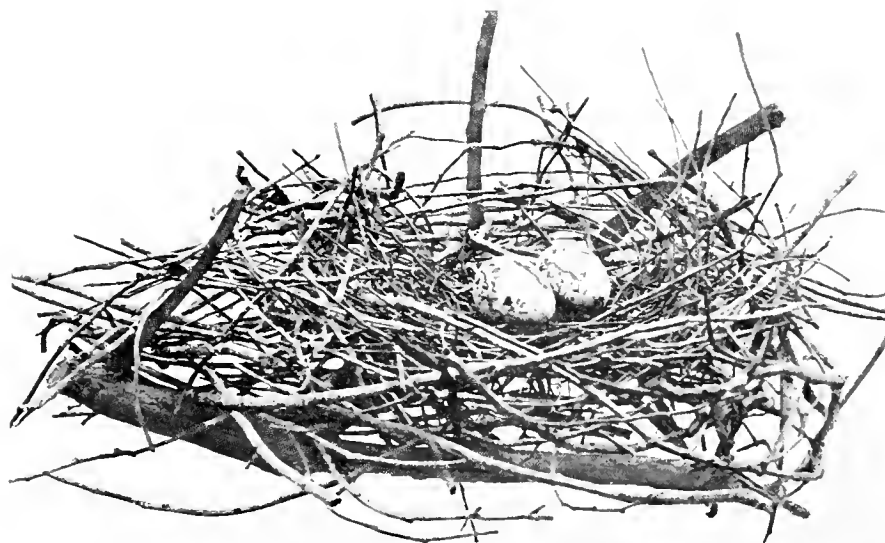
Regarding this species, the late Mr. W. S. Day, who travelled through the principal mining districts of North Queensland, wrote to me as follows:—"I found *C. orientalis* fairly common all the way from Charters Towers to Croydon and Normanton, and from the latter locality south and west to Cloncurry, and on towards Winton. These birds had a perfect craze for bones. While camped on the Leichhardt River I used to shoot a number of pigeons for the pot. When eating them the Bower-birds would watch me from the trees, and the moment I threw the bones away the birds would descend to the ground, pick them up, and carry them away to their bowers. Most of the bowers I examined had a quantity of small bones of mammals heaped up near the entrance, and around them as a rule a number of shells and a few coloured bits of stone. In one bower I found a very bright specimen of gold embedded in glistening white quartz, and when in the opal country I used frequently to find pieces of precious opal in and around them. At a bower near a mining camp I found two tin tea-spoons, portions of a steel watch-chain, a bright sixpence, eleven tin tobacco tugs, and a few horse-shoe nails. The miners do not like these birds, as they pilfer any small bright articles lying about the camp to ornament their bowers; also for the depredations they commit in their gardens, especially among tomatoes."

M. Étable, who has spent many seasons trapping in the Gulf District and northern portions of Central Queensland, informs me that near Croydon these birds are very tame and freely enter the tents of the miners and charcoal-burners, who make great pets of them and will not allow them to be molested. Frequently he saw their bowers, many miles from any habitation, which were bedecked with articles of domestic use, such as blades of penknives, small spoons, buttons, etc., in addition to the usual collection of bones and shells made in the bush.

For an opportunity of first examining the nest and eggs of this species, I was indebted to Mr. Charles French, F.L.S., who kindly placed in my hands for the purposes of describing and figuring a set of these eggs from his son's collection, and who later on presented the nest from which they were taken to the Trustees of the Australian Museum.

The nest, which is here figured, is a very primitive and nearly flat structure, placed at the junction of a forked horizontal branch, and held in position by several thinner upright branches. It is externally constructed of very thin sticks, loosely interlaced, and is lined inside, where there is a saucer-shaped depression, with fine twigs. In general appearance it resembles very much some nests of *Podargus strigoides*, or a large one of *Phaps chalcoptera*, and averages externally eleven inches and a half in diameter, the egg-cavity measuring six inches. The nests are usually built in gum, apple, or tea-trees at an height from twelve to fifteen feet from the ground. One or two eggs are laid for a sitting. Of those in Mr. Charles French, Junr.'s collection—who has kindly lent them for figuring (Plate B. II., Figures 10 and 12)—one is of a faint greenish-grey ground colour, with bold linear markings and numerous wavy thread-like lines of different shades of umber-brown and purplish-grey, crossing and re-crossing each other at different angles, and intermingled with curved wavy lines and faint irregular-shaped smears. These markings are equally distributed over the surface of the shell, except on the thicker end, where on one side there are only a few hair-like streaks. Many curious forms are assumed by these labyrinthine markings, one towards the centre of the shell resembling a man's

face, near it one like a shield, another a Maltese cross, and one on the larger end the figure 8. The other specimen is of a yellowish-stone ground colour, and the linear markings are less conspicuous, being intermingled with small irregularly-shaped confluent blotches of light umber-brown and a few clouded subsurface markings of faint purplish-grey; on the larger end are two blackish-brown linear markings terminating in a spot at one end of each line. The shell is close-grained, and the surface of the latter specimen has a fine gloss on it; the other egg, although smooth, is almost devoid of lustre. The markings on an egg in Mr. G. A. Keartland's collection consist principally of irregularly-shaped blotches and thick, short, wavy streaks of ochraceous and purplish-brown on a fine net-work of zig-zag hair-like lines. In all of these specimens the umber-brown markings predominate, and most of the purplish-grey lines, or clouded smears, appear as if beneath the surface of the shell. They vary in length from 1.56 to 1.67 inches, and in width from 1.1 to 1.16 inches. Another egg, from a set of two in Mr. J. Gabriel's collection, is more elongate in form and has the ground colour almost obscured by a net-work of very fine dark brown hair lines, especially on the centre and thinner half of the shell, the narrow lines being wound latitudinally round and around the egg, revealing only in one or two places a trace of similar underlying markings of purplish-grey:—



NEST AND EGGS OF EASTERN BOWER BIRD.

Length 1.71
× 1.1 inches.
A glossy and
very evenly
marked egg
in Mr. Keart-
land's collec-
tion, taken by
Mr. William
Munt on the
27th January,
1900, at Mar-
ton, about five
miles from
Cooktown,
measures 1.75
× 1.12 inches.
This egg,
which was
partially in-

cubated, was taken from a nest in the top of a Bloodwood (*Eucalyptus corymbosa*) sapling, at a height of twelve feet from the ground.

Mr. E. A. C. Olive has kindly presented birds and eggs of this species to the Trustees of the Australian Museum, and from his letter accompanying the specimens I have extracted the following information:—The males are far more shy than the females and young males. I have shot fully two dozen near Cooktown during January and February without any trace of the pink nape spot. The nest is a loosely built structure formed of large twigs, some of them being nearly as thick as a lead-pencil, the inside being lined with fibres and roots. One can see through the nest from the ground and detect whether it contains eggs or not. They select a tea-tree for preference, and generally an overhanging branch with thick foliage, but I have found them in various other trees at a height of about twelve feet from the ground. Both birds are very shy during the breeding season, and always leave the nest before one approaches it. I usually obtain their eggs from the first week in October up to the end of December, but in 1895 we had rain in August and they nested then. Two eggs are sometimes

laid for a sitting: I have, however, found at different periods over two dozen nests with a single egg in each, and nearly always incubated."

The eggs received from Mr. Olive have the fine linear markings on the ground colour more sparingly distributed, and intermingled with bold blotches and conspicuous irregular-shaped dashes and streaks of dark umber-brown, and similar underlying markings of dull violet-grey: Length (A) 1.05×1.1 inches: (B) 1.0×1.07 inches.

Chlamydodera cerviniventris.

FAWN-BREASTED BOWER-BIRD.

Chlamydodera cerviniventris, Gould, Proc. Zool. Soc., 1859, p. 291: *id.*, Bds. Austr., fol., Suppl., pl. 36 (1860).

Chlamydodera cerviniventris, Gould, Hanbkk. Bds. Austr., Vol. I., p. 151; Sharpe, Cat. Bds. Brit. Mus., Vol. VI., p. 393 (1881); Salvad., Orn. Pap. et Molluc., pt. II., p. 664 (1881).

ADULT MALE.—General colour above brown, with an ashy shade; all the feathers of the back and scapulars having narrow shaft-lines and a small spot at the tip of buffy white, these streaks and tips being slightly larger and darker on the rump and upper tail-coverts; lesser and median wing-coverts like the back, the greater and primary coverts more largely tipped with white; primaries and secondaries brown, externally washed with pale greyish-brown, being more conspicuous on the secondaries, which are tipped with white; tail feathers brown, narrowly margined with pale greyish-brown and tipped with white; head ashy brown, all the feathers of the face streaked with fulvous white, these streaks becoming broader and darker on the sides of the head, and passing into pale fawn-buff on the feathers of the throat, which are narrowly edged with brown; lower neck and chest fawn-buff, the feathers in the centre edged, and those on the sides broadly margined with brown; remainder of the under-surface, and under tail, and under wing coverts clear fawn colour; bill blackish brown; legs and feet grey; iris reddish-brown. Total length 10.5 inches, wing 6, tail 4.8, bill 0.95, tarsus 1.65.

ADULT FEMALE.—Similar in plumage to the adult male.

Distribution.—Cape York Peninsula, New Guinea, Louisiade Archipelago.

THE male of the Fawn-breasted Bower-bird may be distinguished from those of all other species of the genus by the absence of the beautiful rose-lilac frill on the nape. This species was one of the novelties secured by the late Mr. John MacGillivray at Cape York, during the stay there of Her Majesty's surveying ship "Rattlesnake," in October, 1848. In the same locality Mr. J. A. Thorpe, during a seventeen months' residence there in 1867-8, succeeded in obtaining several specimens and found two of their bowers. In 1875 both D'Albertis and Mr. George Masters obtained specimens at Hall Sound, to the north-west of Port Moresby, New Guinea, and the late Mr. A. Goldie procured its eggs at Milne Bay. Since that time it has been found by many collectors in that large island, teeming with a rich and varied avifauna. Mr. DeVis has also recorded it from Sudest Island, in the Louisiade Archipelago, from a male obtained there by Sir William MacGregor on the 30th June, 1891. In Australia I have never seen a specimen from any place but the extreme northern portion of the Cape York Peninsula, but in the "Catalogue of Birds in the British Museum,"¹ the locality of a specimen in the Gould Collection is there given as "Rockingham Bay." Count Salvadori,² and Dr. Sharpe,³ both

¹ Ann. Queensl. Mus., No. 2, p. 9 (1892).

² Cat. Bds. Brit. Mus., Vol. vi., p. 394 (1881).

³ Orn. Pap. et Molluc., Vol. ii., p. 665 (1881).

⁴ Mon. Paradis and Ptilono., Vol. ii., p. 62 (1898).

state that they cannot find any authority for Dr. G. R. Gray's inclusion of the Islands of Torres Strait in the habitat of this species. In the "Narrative of the Voyage of the Rattlesnake," MacGillivray does not mention meeting with this species, except at Cape York where he obtained only a single specimen. In the Appendix to Volume II., p. 357, however, it is included in the third column "devoted to the islands of Torres Strait, from Raine Islet to Bramble Cay," as well as in its proper place in the second column, comprising "the remainder of the north-eastern coast of Australia, from Lat. 17° 45' South as far northward as Cape York." The inclusion of this species in the column devoted to the birds inhabiting the islands of Torres Strait is probably a *lapsus calami* or a typographical error, and is doubtless the source from whence Dr. Gray derived his authority for recording it as an inhabitant of these islands.

Relative to this species, Mr. J. A. Thorpe writes as follows: "While collecting on the Cape York Peninsula, in 1867-8, I occasionally met with *Chlamydodera cerviniventris* in the immediate vicinity of Somerset, opposite Albany Island, and also near the mouth of the Jardine River where it enters Endeavour Strait; a distance of thirty miles from the extreme point of the Peninsula. The country there consists chiefly of wide belts of scrub, interspersed with open narrow stretches of sandy soil covered with tall grass and a few scattered bushes. I found two of their bowers in these open places, neither of them being far from the coast; they were formed of twigs, and averaged about two feet six inches in length, and the only decorations I saw about them were a few shells, pebbles, and berries. These birds were by no means plentiful, extremely shy, and frequented chiefly a vine growing luxuriantly in the scrubs and known as the 'Native Grape.' This plant bears bunches of a small reddish-black edible fruit, on which the Fawn-breasted Bower-bird chiefly subsists. During a stay of seventeen months in those parts I only succeeded in obtaining about a dozen specimens."

Mr. Bertie L. Jardine has kindly furnished me with the following notes:—"The Fawn-breasted Bower-birds are permanent residents in the northern parts of the Cape York Peninsula, over which they are fairly distributed but are nowhere numerous. They frequent scrubs growing in soft sandy soil in the neighbourhood of the sea, and low brush bordering creeks and rivers. Usually they are shy and retiring, and are met with in pairs, but sometimes they may be seen in small companies from four to eight in number as they traverse the open parts of the forest in search of food. While flying from tree to tree or running along the ground, over which they pass with great rapidity, they occasionally utter a number of extraordinary notes in slow succession. Among the brush-wood bordering the beautiful white sandy banks of the Jardine River, I have found many of their artfully constructed bowers or playing-places. The walls of these bowers or avenues are formed externally of thin sticks, and are beautifully lined inside with very fine twigs. At both ends or entrances of these structures, for about two or three feet, are a number of pieces of bleached bones, berries, leaves, shells, and portions of the smaller crustacea, etc., some of these decorations being also placed inside the bower. The bowers average about three feet in length, eighteen inches to two feet in breadth, and from twelve to fifteen inches in height. Just after day-break, and again about sunset, it is a very interesting sight to watch these birds playing about the bower. They may be seen running through and around the structure, with their primaries trailing along the ground, stopping now and again to pick up a bone, feather, shell, or berry, while their companions are perched in the neighbouring trees uttering all the time their peculiar notes. Well beaten paths from three to five inches in width are made by the birds almost constantly running or chasing one another around the bowers."

A nest of this species, taken by Mr. Jardine from a fork in a large tea-tree, is a cup-shaped structure, formed throughout of thin twigs, dried plant stalks, and has a quantity of

strips of bark worked into the foundation: the inside being lined entirely with fine twigs. It averages externally eight inches in diameter by four inches in depth, and the inner cup five inches in diameter by two inches and a half in depth.

Another nest, taken at Cape York, was an open cup-shaped structure, formed of dead twigs lined with dried grasses, a few pieces of bark being worked into the lower part of its foundation, and contained a single fresh egg. This specimen, which is represented on Plate B. II., Figure 8, is slightly shorter and more swollen in form than typical eggs of *C. maculata*, but has the same close-grained shell and slightly glossy surface. It is of a very pale olive-green ground colour with linear zig-zag wavy streaks and a few spots of different shades of light and dark umber-brown confined principally to the thicker end of the shell. Length 1.41×1.05 inches. Two eggs I saw that were taken near Port Moresby, New Guinea, had the markings, which consisted of short wavy umber-brown streaks, uniformly and thickly distributed over the surface of the shell.

A beautiful egg of this species, taken by Mr. Bertie L. Jardine, at Somerset, on the 11th November, 1901, and kindly lent by him for description, is elongate-oval in form, the shell being close-grained, and its surface smooth and slightly lustrous. It is of a faint creamy-white ground colour, tinged with olive, and has numerous well-defined thread-like lines wound latitudinally and irregularly round and around the shell, with which are intermingled bold zig-zag and wavy cross-lines, loops, scrolls, and angular streaks of dark purplish-brown, and a few faint underlying hair-like lines and streaks of dark purplish-grey: in one place where several of the broader and darker lines are confluent, a large conspicuous knot-like marking is formed; on other parts of the shell they assume the form of broad streaks, while on the pointed end is a single isolated fish-hook shaped marking of purplish-brown. Length 1.6×1.1 inches. This egg, which was fresh, and the only one in the nest, is larger and the markings are more uniformly distributed over the entire surface of the shell than in the specimen of *C. cerviniventris*, figured on Plate B. II. It more closely resembles in shape, size, and character of some of its bolder markings, Figure 11 on the same plate of the egg of *C. crinitalis*, to which may be added the clear and well-defined thread-like lines and streaks shown on Figure 7 of the egg of *C. guttata*.

The egg figured and described by Dr. A. B. Meyer as that of an unknown species of *Chlamydodera*, under the name of *C. recondita*, is now regarded by Dr. Meyer as the egg of *C. cerviniventris*. It was found by Herr A. Grubauer in February, 1892, at Constantine Harbour, German New Guinea, lying almost without any support in a large curved leaf of a palm, about three feet above the water.

Genus SERICULUS, Swainson.

Sericulus melinus.

REGENT BOWER-BIRD.

Turdus melinus, Lath., Ind. Orn., Suppl., p. XLiv., (1801).

Sericulus chrysocephalus, Gould, Bds. Austr., fol., Vol. IV., pl. 12 (1848).

Sericulus melinus, Gould, Handbk. Bds. Austr., Vol. I., p. 456 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VI., p. 395 (1891).

ADULT MALE—*Head, hind neck, and mantle, bright orange-yellow; sinciput reddish-orange; back, rump, and upper tail coverts black; upper wing coverts black; first two primaries black, the next three black, orange-yellow on their inner webs, except on the apical portion; the remainder of the primaries*

* Abhandl. k. zool. Mus., Dresd., No. 10, p. 2 (1895).

and the outer secondaries orange-yellow, black at the tips, the black tips decreasing in size towards the innermost secondaries, which are orange-yellow; lores, a broad line of feathers extending over the eye, sides of the face, all the under surface, and under tail coverts black; bill yellow; legs and feet black; iris straw-white. Total length in the flesh 10 inches, wing 5.1, tail 3.8, bill 1, tarsus 1.45.

ADULT FEMALE—General colour above brown: the feathers of the mantle and back with narrow blackish edges and white centres, those of the rump and upper tail coverts with a small spot of dull white near the tip: wings and tail brown, the inner secondaries with a spot of white at the tip of their outer webs: forehead, sides of the head, and hind neck, brownish-white with dusky edges to all the feathers: crown of the head and the lower hind neck black: chin and sides of the throat dull brownish-white, the feathers on the sides of the lower throat dark brown, with small brownish-white centres: centre of the throat black: remainder of the under surface dull white, the feathers of the chest crossed in the centre and edged with dusky-brown, those of the breast, flanks, abdomen, and under tail coverts having brown cross-bars, less distinct on the centre of abdomen and the under tail-coverts: bill blackish-brown: legs and feet blackish-brown: iris brown. Total length in the flesh 10.5 inches, wing 5.2, tail 4, bill 1, tarsus 0.45.

Distribution.—South-eastern Queensland, North-eastern New South Wales.



REGENT BOWER-BIRD.

FOR brilliant and richly contrasted plumage, the adult male of the Regent Bower-bird surpasses all other birds in Australia. It is, however, closely approached by the more uniformly but gorgeously plumaged adult male of Newton's Bower-bird, to which it bears some resemblance in size and colour. The former, characterised by Latham in 1801 as *Turdus melinus*, was the first described of those birds now included in the family Ptilonorhynchidae, although its bower-building habit was not discovered until many years after. Newton's Bower-bird is the latest addition to the family in Australia, being described by Mr. De Vis as *Prionodura newtoniana* in 1883. Although somewhat resembling each other in colour, between these two species there is a wide line of demarcation in the construction of their bowers. The Regent Bower-bird builds the smallest and most primitive structure of any species belonging to the family, while that of Newton's Bower-bird is the largest and most aesthetically decorated.

The coastal brushes of New South Wales lying between the Bellinger and Tweed Rivers are the stronghold of the Regent Bower-bird, its range extending as far north as the neighbourhood of the Mackenzie River, in Queensland, where Mr. J. A. Thorpe secured six specimens in 1865. South, its present range does not extend farther than the rich brushes about Ourimbah, Narara, and Gosford, on the northern side of the Hawkesbury River. I have never seen, or heard of it being found south of that river, although at the time of Gould's visit to Australia, in 1838-9, he states it was occasionally seen in the neighbourhood of Sydney. Owing probably to settlement, and the clearing and burning of the brush, like several other species, it has been driven away from its old haunts. South of the Hawkesbury River, however, the character of the country and vegetation entirely changes, and with the exception of a patch of rich brush land near Narrabeen and Cowan, a similar luxuriant subtropical growth is not met with until

near Otford and Bulli, on the southern boundary of the county of Cumberland. In the latter localities the Cat-bird, Satin Bower-bird, and other brush frequenting species are found, but not the Regent Bower-bird.

To the southern limit of its range, in the neighbourhood of Ourimbah and Gosford, this species is a partial migrant; large flocks of females and young males appearing when there is a plentiful supply of wild fruits and berries, about the middle of July, and which are followed by straggling flocks of fully adult males three or four weeks later. At the same season the Cat-birds and Satin Bower-birds are plentiful in these brushes, and may be frequently seen in the same tree in company with the Regent Bower-birds. During the winter months both sexes of the latter species may be easily obtained just about daylight if one is stationed beneath one of their feeding-trees. In the spring the greater number either leave the district, or paired, are dispersed through the dense brush for the purposes of breeding. Owing to the undergrowth and tangled masses of Bramble (*Rubus moorei*), known in the Gosford and Illawarra Districts as the "Bush Lawyer," it is almost impossible for one to explore these secure haunts, except by way of the few tracks made by the timber getters, although of recent years the undergrowth has been gradually cleared away in the vicinity of Ourimbah. At the end of November I saw only a few isolated adult males, and they were extremely shy, keeping as a rule to the tops of the tallest timber, and flying away on my approaching near the tree they were in. Evidently the females were sitting, for I saw the males day after day in the same place on the edge of the brush, and being about a quarter of a mile away from one another. That many pairs remain to breed is proved by my finding at Ourimbah a nest on the 9th November, 1901, and underneath it the half shell of an unusually well marked egg, and two days later similar evidence under another tree fifty yards away. Fledgelings were also obtained in the same district in January. In the autumn they probably retire north again, for only a few straggling individuals are seen at the end of April, although I once saw at the end of May a young male with an admixture of black and yellow feathers with the brown, which had been shot on the previous day at Gosford.

During a collecting trip to the Bellinger River, undertaken by Mr. R. Grant on behalf of the Trustees of the Australian Museum in June, 1892, these birds were not met with until the beginning of July, when large flocks of females and young males made their appearance, the males not arriving until the end of August.

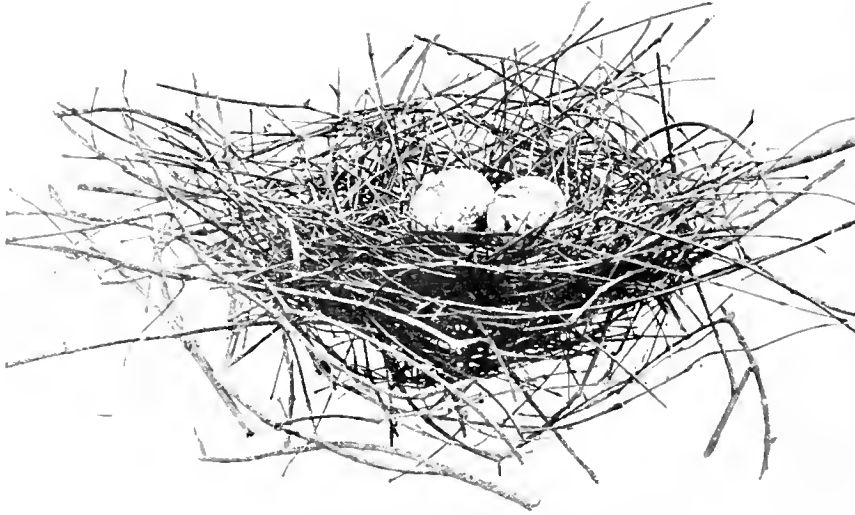
Mr. J. A. Thorpe informs me that near Brisbane these birds were common in the scrubs on the river three miles above the town in 1865. While living there, two brothers he knew went out especially to secure the adult males. One obtained from a single giant fig-tree seventeen beautiful old males; the other shot twenty-three from another fig-tree in a different part of the scrub. It was in these scrubs that the bower-building habit of this species was first discovered by Mr. Waller, of Brisbane, and the fact was recorded by the late Mr. Charles Coxen at a meeting of the Queensland Philosophical Society in 1864. From his account the following extracts are made:—"The bower of the Regent-bird differs from the Satin-bird's in being less dome-shaped, straighter in the sides, platform much less, being only ten inches by ten, but thicker in proportion to its area, twigs smaller and not so arched, and the inside of the bower smaller; indeed I believe too small to admit an adult Satin-bird without injury to its architecture. The decorations are uniform, consisting only of a small species of *Helix*, herein forming a marked distinction from the Satin-bird. The ground around the bower was clear of leaves for some twelve or eighteen inches, and had the appearance of having been swept. The structure was alike at both ends, but the part designated as the front was more easy of approach and had the principal decorations, the approach at the back being { more closed by scrub."

The bower-building habit of the Regent Bower-bird was confirmed by Dr. Ramsay two years afterwards, by ensnaring a fine old adult male at a similar structure he found built near a log in the scrub about twenty miles from Lismore, on the Richmond River, New South Wales. In addition to the land-shells found inside the bower, were several berries and newly-picked leaves and young shoots. The latter floral decorations are frequently used by these birds to ornament their bowers in the brushes of the Tweed, Richmond, and Bellinger Rivers.

The food of this species consists of various wild fruits, berries, and insects. At Ourimbah I saw them feeding on the berries of the ink-weed (*Phytolacca octandra*), growing on the roadside. The stomachs of specimens I examined from this locality contained a few small fruits and berries, and the heads, legs, and elytra of beetles, conspicuous among the latter being the brightly coloured wing-cases of *Lamprina latreillei*, Macleay. It is also very fond of cultivated fruits. Mr. B. Lucas informs me that on the Upper Orara River he has seen large flocks of these birds, in company with the Satin Bower-birds and Cat-birds, congregate in the introduced tobacco plants which flourish on the river flats, and that he used frequently to catch the Regent Bower-bird by placing some loquats under a trap when these trees were denuded of their fruit. Those kept in confinement he fed principally upon bananas. I have also observed

those in the Sydney bird-dealers' shops, at various times, being fed on the same kind of fruit.

A nest now before me, found by Mr. H. R. Elvery near Alstonville in the Richmond River District, on the 19th December, 1896, is a scanty and very carelessly built structure. Near the tops of



NEST AND EGGS OF REGENT BOWER-BIRD.

several thin, rigid, and upright leafy branchlets, some long and nearly straight twigs are placed horizontally across as a foundation, and on the top of this is a loosely formed cup-shaped structure, made of thinner twigs. It was built about twelve feet from the ground, the bush being over-grown with Lawyer vines, and contained two slightly incubated eggs. The long straight twigs laid horizontally across average thirteen inches in length, the inner cup-like cavity four inches in diameter by one inch and three-quarters in depth. Another nest found by him on the 13th January, 1897, and figured above, was built at the junction of three thin branches of what is locally known as the Water Fig (*Ficus aspera*), and partially held in position by several leafy twigs. Exteriorly it is roughly and irregularly formed of long twigs; the inside, which is deep saucer-shape, being neatly lined with fine short twigs. In outward measurements it averages eight inches in diameter, although a few of the long twigs first laid as a foundation measure nearly twelve inches. Across the top of the deep saucer-like cavity it averages four inches and three-quarters by a depth of one inch and a half. The female, after being twice flushed from the nest, which contained two fresh eggs, was shot and forwarded with the nest and eggs to the Trustees of the Australian Museum. I found a similar structure

on the 9th November, 1901, at Ourimbah. It was built in a drooping branch of a large "Maiden's Blush," (*Sloanea australis*), growing on the bank of a creek, and was about twenty feet from the ground.

The eggs are usually two, sometimes three, in number for a sitting, and are oval, elongate-oval, or rounded-oval in form, the shell being close-grained, and its surface smooth and lustrous. In ground colour they vary from a yellowish-stone colour to a faint greyish or dull white. Of a set of three, lent by Mr. Elvery, two are typical ovals, the other is nearly an ellipse in form. All are of a pale yellowish-stone ground colour, with long irregular lines, ill-shaped figures, loops, and scrolls of light-umber-brown, encircling the shell, and fairly evenly distributed, with similar but less numerous underlying and clouded markings of dull violet-grey; some of the lines are broad and blurred, others fine and very distinct. In one specimen there is a patch of well defined purplish linear markings near the smaller end, and a few finer purplish-black lines on the larger end. All have a few short wavy black hair-lines, hardly visible to the naked eye: Length (A) 1.5 × 1.1 inches; (B) 1.49 × 1.12 inches; (C) 1.53 × 1.06 inches. A set of two in the Australian Museum collection are oval in form and darker in ground colour, being of a pale cream-buff, and more sparingly and unevenly marked. One specimen has fine blurred zig-zag linear markings of different shades of sienna and umber-brown, intermingled with a few faint underlying markings of dull bluish-grey; the other has the zig-zag linear surface markings broader and darker, and interspersed with several large smudges and patches of rich umber-brown, some of the latter looking as if they had been placed on the shell with a finger dipped in colour, and a single black linear streak half encircling the shell on the larger end: Length (A) 1.56 × 1.09 inches; (B) 1.49 × 1.1 inches. Another set of two, lent by Mr. George Savidge, varies considerably from the two sets above described. They are of a pale stone-grey ground colour, with short streaks, irregular-shaped blotches, spots, and dots of different shades of umber-brown, evenly distributed over the surface of the shell, intermingled with similar but almost obsolete underlying markings of dull bluish-grey. One specimen has an almost straight linear streak near the centre of the shell, and another very fine ink-hued hair-line on the larger end which resembles a crack in the shell. Length (A) 1.58 × 1.08 inches; (B) 1.52 × 1.07 inches. In the general character of the markings, this set is not unlike a variety of the eggs of the Satin Bower-bird. Other specimens I have examined, taken in Queensland, have the ground colour greyish-white, and the linear markings confined chiefly to the thicker half of the shell; a rare variety has the ground colour pale greenish-grey like the egg of the Spotted Bower-bird. In shape, size, colour, and character of markings, typical eggs of *Sericulus melinus* are almost indistinguishable from those of *Chlamydodera maculata*, except in the ground colour. The ground colour of typical eggs of the former is yellowish-stone colour, that of the latter pale greenish-grey.

Young males resemble the females, and assume the adult plumage chiefly by a change of feather colour and not by moult. One now before me has the head, sides of the neck, mantle, scapulars, and back black, rump and upper tail-coverts dark brown, and changing into black; on the hind neck a large patch of bright yellow feathers with small blackish tips; wings as in the adult bird, but slightly duller in colour, and the tips of the secondaries and outer webs of the greater wing-coverts with pale yellowish-brown edges; tail feathers black, brownish at the tips; sides of the head and neck, throat, and breast black; remainder of the under surface and under tail coverts dull straw-white with blackish cross-bars to all the feathers. Wing measurement as in the adult bird, 5.1 inches.

Another specimen has the head, nape, hind-neck, and mantle as in the adult male, but duller in colour and with blackish tips to some of the feathers, and those on the scaput being black instead of deep reddish-orange; mantle and upper back black; lower back and rump as in the adult female; upper tail-coverts brown, the lower ones with black centres; two central

tail feathers black, edged with brown; the remainder brown, with narrow black shaft stripes; lesser and median upper wing-coverts brown, the inner series passing into black; the greater coverts black; primaries and secondaries as in the adult male, but with brownish edges to the outer webs of the primaries, and blackish edges to the secondaries; lores, feathers above the eye, sides of the head and neck, throat, and chest black, and gradually passing into the adult plumage of the female on the remainder of the under surface.

In a large series of the Regent Bower-birds in the Australian Museum collection, several of the adult males have the lateral tail feathers narrowly edged with yellow near the tip of their inner webs. The black feathers on the hind neck and the centre of the throat of the adult females, too, vary from a broad line to a conspicuous black patch. The bird figured represents an adult male.

In the brushes of the northern coastal rivers of New South Wales, November and the three following months constitute the usual breeding season of this species; but near the southern limit of its range, it commences a month earlier.

Genus PRIONODURA, De Vis.

Prionodura newtoniana.

NEWTON'S BOWER-BIRD.

Prionodura newtoniana, De Vis, Proc. Linn. Soc. N.S.W., Vol. VII., p. 562 (1883), (fem.); *id.*, Proc. Roy. Soc. Queensld., Vol. VI., p. 247 (1890), (male); Sharpe, Mon. Paradis. and Ptilono., Vol. II., pl. 24 (1898).

ADULT MALE—*General colour above golden-olive; a broad crest on the crown of the head, the hind-neck, and upper mantle, rich golden-yellow; upper wing coverts like the back; primaries and secondaries brown, washed with golden-olive, which is more distinct on their outer webs; two central tail feathers brown, slightly washed with golden-olive; the next on either side golden-yellow, with the apical half of the inner web and a broad tip brown, the next golden-yellow, brown at the tip, the remainder golden-yellow; lores, sides of the face, chin, cheeks, ear-coverts, and sides of the hind-neck, golden-olive; throat, all the under surface, and under tail-coverts bright golden-yellow; bill dark brown, paler at the tip; legs and feet dark slate colour; iris pale yellow. Total length 9·5 inches, wing 5, central tail feathers 3·6, outer tail feathers 3·8, the second feather from central pair 4·3, bill 0·55, tarsus 1·2.*

ADULT FEMALE—*General colour above olive-brown; wings brown, washed with olive, some of the secondaries with a faint golden-olive wash on their outer webs; tail brown; a spot in front of the eye dusky-brown; cheeks and ear-coverts olive-brown; all the under surface ash-grey, washed with brown on the lower throat, sides of the breast, and the abdomen; under tail-coverts brown; bill dark brown, paler at the tip; legs slaty-black; iris brown. Total length 8 inches, wing 4·6, tail 3·6, bill 0·6, tarsus 1·2.*

Distribution.—North-eastern Queensland.

TO record all the members of this extraordinary family inhabiting Australia, I have here included Newton's Bower-bird and the Tooth-billed Bower-bird, although up to the present time no properly authenticated nest and egg of either species have been described. Newton's Bower-bird was for many years known only from a single example. This specimen, a sombre-plumaged female or young male, was obtained by Mr. Kendal Broadbent in the scrubs of the Tully River, in September, 1882, and was described by Mr. C. W. De Vis, M.A., in the Proceedings of the Linnean Society of New South Wales in the following year. After the

* Proc. Linn. Soc. N.S.W., Vol. vii., p. 562 (1883).

lapse of seven years, a gorgeously liveried male was shot by Mr. A. Meston, in February, 1889, on Bellenden Ker Range, at an elevation of 4,800 feet. This was sent to the Queensland Museum, where shortly afterwards a series of the skins of this species was received from Mr. Broadbent, who was at that time engaged in collecting near Herberton, enabling Mr. De Vis to also describe the male.

A scientific expedition, equipped by the Queensland Government in June, 1889, to collect the flora and fauna of the Bellenden Ker Range, succeeded in obtaining several specimens. So likewise did Messrs. E. J. Cairn and R. Grant, who were simultaneously engaged in collecting natural history specimens, in the same part of North-eastern Queensland on behalf of the Trustees of the Australian Museum. The results of the former expedition were published,[†] and the habits and bower of this species described. A brief description of the latter was also furnished by Messrs. Cairn and Grant in their Report to the Curator.



NEWTON'S BOWER BIRD.

Mr. E. A. C. Olive forwarded me one of these birds for identification. It was a fine old male, and was obtained near the summit of Mount Cook, on the 28th May, 1894. Mount Cook, near Cooktown, on the Endeavour River, is 14,700 feet high, and is the farthest north this species has yet been recorded.

The wing measurement of adult males varies from 4.6 to 5 inches.

Apart from the brilliant and attractive plumage of the male, the singular form of the bower of this species, and the aesthetic taste exhibited by these birds in its decoration, renders Newton's Bower-bird the most remarkable of the family Ptilonorhynchidæ. It is the smallest species of Bower-bird inhabiting Australia, yet it forms the largest bower, when the structure is resorted to for several years. The sticks with which the bower is formed are piled

up horizontally, or nearly so; the walls inside at the top are wider apart than at the bottom, and the whole of the decorations are floral.

The late Mr. W. S. Day, who collected several hundred of these birds, during a nine years' residence in the vicinity of their haunts, and who had unparalleled opportunities for closely studying their habits, kindly favoured me with the following notes:—"Newton's Bower-bird frequents Mount Bartle Frere and the Bellenden Ker Range. Near Cairns I met with it, principally at Boar Pocket, Scrubby Creek, and the Upper Russell River. It is always found in or near thick scrub and never in the open forest country below the range. Although a permanent resident in these scrubs, it moves about from place to place according to the abundance of its food supply, for it lives entirely on wild fruits and berries. The note of the male is very difficult to imitate, but when playing in the bower he frequently utters a sound like the croaking of a bull-frog. He also possesses the power of mimicry, and I have often heard him imitate the notes of the Tooth-billed Bower-bird, the Spotted Cat-bird, and Queen Victoria's Rifle-bird. The note of the female is like that of the Grey Shrike-Thrush

* Proc. Roy. Soc. Queensland, Vol. vi., p. 247 (1890).

† Rept. Queensland Govt. Sci. Exped. to Bellenden Ker Range. (1889).

‡ Rec. Aust. Mus., Vol. i., p. 27, (1890).

(*Collyriocincla harmonica*), but not so loud, and as they are somewhat alike in colour and form, I have frequently mistaken one for the other in the thick scrub. I have found a great number of their bowers. Those of the first season are simply a lot of sticks and twigs placed around two small trees growing about a yard or slightly more apart. The following season it is added to, and gradually assumes a V shape at the bottom of the inner portion, being now about two feet in height. As a rule, there is a stick placed transversely across the bower, within five or six inches of the bottom. The walls are added to each season, but one is always built higher than the other after the first year. The largest I ever found was nine feet high on one side and six feet six inches on the other, and resembled two pyramids of different heights with their bases touching each other. Some bowers are rounded at the bottom, and nearly all I have seen are more or less ornamented with floral decorations according to the season of the year. These consist of pieces of green moss, bits of fern, white rock-lilies, orchids, and flowers of other plants, and are placed inside on the higher wall and at the bottom of the bower. Seldom have I found a bower with the lower wall decorated. The flowers are quite fresh, the birds picking out the dead ones every day and replacing them with freshly gathered specimens. Sprigs of pure white orchids and wax-like rock-lilies are the flowers most favoured for decorating purposes. Although these bowers are used by both sexes as a play-ground where they can chase and gambol with one another, they are frequently the scene of a pitched battle between a couple of adult males. This is caused by one male removing the flower placed in position by another, and a fight ensues, the remainder of the birds looking on and making a great noise, but not interfering with the combatants. I have never seen the females or young males fight, it is always the finest plumaged old males. These birds are very tame, and I have sat for several hours at a time watching their curious antics at the bowers. The flowers are all placed upright, inside their play-houses, but to see what the birds would do I once turned one of their orchids upside down. On the birds reassembling they made a great fuss and noise, and one of the old males replaced the flower in its proper position. I repeated the operation, and the flower was again placed upright by the old male. The large bowers are resorted to by a number of birds, and I have obtained over thirty at various times at a well frequented play-house. On Mount Bartle Frere I found fifteen of their bowers of different sizes within a radius of one hundred yards. I have also seen them fully a mile apart.

"The aborigines of the Bellenden Ker Range snare these birds by means of birdlime, of which I send you a sample. They make it in a very simple manner from the different species of fig and a pine. Cutting the stem of one of these trees, from which a milk-like sap will freely exude, they work the sap up in their mouths, or wet hands, into a ball. This mass when wet will not stick, but when free from moisture forms a very good lime. The sticks of the bower are then smeared with this preparation and the birds are easily caught. The birds do not frequent the bower during the wet season. I have also seen Parrakeets and Crows securely held with this viscous substance. For the latter they place a piece of meat on the end of a stick, smeared with the lime, and which is stuck upright into the ground, the native in the meantime lying concealed near at hand until one of the birds is caught. It is not much used, however, owing to the humid atmosphere of these ranges during the greater part of the year, for if a shower comes on it has to be worked up again before it will adhere."

Mr. Day forwarded sketches of several of the bowers he had seen, together with their measurements and decorations. They vary from two to nine feet in height on the higher side, and from eighteen inches to six feet six inches on the lower, the decorations sent consisting chiefly of rock-lilies, a species of whitish flower resembling apple-blossom, mosses, bits of fern, berries, and clusters of small grape-like fruits. A bower found by Mr. Day on the 14th May, 1898, near the Upper Russell River, he informs me, was built near a large fig-tree on a hill-side, overgrown with saplings, ribbon and tassel ferns, and partially sheltered at one end by a

moss-covered rock, the entrance to the bower facing down hill. The pyramidal walls forming it were constructed around two small trees, and measured three feet six inches high on one side and three feet on the other; seven inches apart across the floor of the bower, and two feet two inches apart at the top. The inside of the higher wall was well covered for two feet with pieces of moss and white flowers, which got less in number as they approached towards the top; a few flowers were also placed on the ground in front of the bower. Mr. Day also sent me a photograph of a bower, found by him on Mount Bartle Frere on the 9th October, 1896, measuring six feet two inches in height on the higher side. It is of the usual double pyramidal form with a thick stick or root connecting the two sides about eight inches from the bottom, the inside of the higher wall being partially covered with apparently white flowers. Unfortunately the bower was surrounded with dense vegetation, and the photograph obtained is too indistinct for reproduction.

Mr. R. Grant informs me that all the specimens brought back by Mr. E. J. Cairn and himself from their North-eastern Queensland expedition in 1880, were obtained on Mount Bartle Frere and different peaks of the Bellenden Ker Range. Also, that when at the bower the male erects his crest and expands the tail-feathers, the central pair of the latter, being shorter gives it when spread a rounded fish-tail appearance. The call is a frog-like croak, very difficult to imitate, and the stomachs of the birds they procured contained small fruits, berries, and insects.

Young males are similar in plumage to the adult female, the first sign of their approach to maturity appearing in the strong golden-olive wash to the back, and the gradual change to bright golden-yellow of the feathers on the breast; the under-surface of the quills and tail-feathers, too, are washed with golden-yellow, and all their shafts are bright golden-yellow. Like the Regent Bower-bird it is probable that the fully adult plumage of the male of this species is assumed by a change of feather colour, more than by moult. The bird figured represents an adult male.

Genus SCENOPOÆETES, *Coues*.

Scenopœetes denti-rostris.

TOOTH-BILLED BOWER-BIRD.

Scenopous denti-rostris, Ramsay, Proc. Zool. Soc., 1875, p. 591; Gould, Bds. New Guin., Vol. I., pl. 43 (1880); Sharpe, Cat. Bds. Brit. Mus., Vol. VI., p. 394 (1881).

Scenopœetes denti-rostris, Coues, Auk., Vol. VIII., p. 115 (1891).

Tectonornis denti-rostris, Sharpe, Mon. Paradis. and Ptilono., Vol. II., pl. 40 (1898).

ADULT MALE.—*General colour above olive-brown, slightly darker on the head, and a clearer olive on the upper tail-coverts; upper wing-coverts and inner secondaries like the back, remainder of the secondaries and the primaries brown, washed with olive-brown on their outer webs; tail olive-brown; around the eye a ring of dull ochraceous-rufous feathers; ear-coverts olive-brown with lighter shaft-streaks; sides of the throat fulvous with narrow olive-brown edges to the feathers; remainder of the under-surface fulvous with broad dusky-brown margins to the feathers; under tail-coverts fulvous, each of the feathers having two dull brown V-shaped cross-bars; bill and legs dark reddish-brown; iris reddish-brown. Total length 10.5 inches, wing 6, tail 4.2, bill 0.92, tarsus 1.25.*

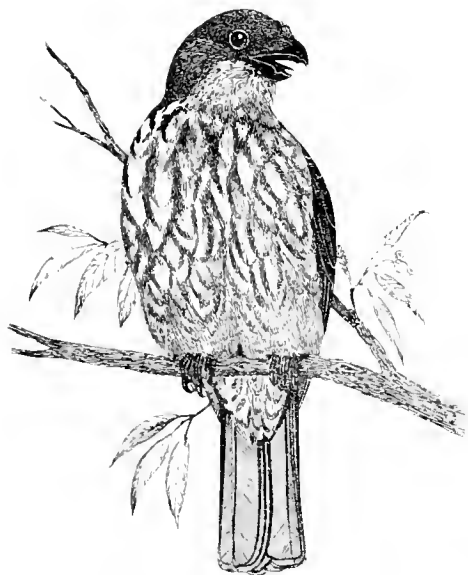
ADULT FEMALE.—*Similar in plumage to the male.*

Distribution.—North-eastern Queensland.

THE Tooth-billed Bower-bird discovered by Inspector Johnstone in the scrubs of the Sea-view Range in North-eastern Queensland in 1874, and described by Dr. Ramsay in 1875, was for many years regarded as a rare species. Consequent, however, upon a visit to the Bellenden Ker Range by Messrs. E. J. Cairn and R. Grant in 1887, who were collecting on behalf of the Trustees of the Australian Museum, the collection was enriched by twenty-six specimens in various stages of plumage. Numerous examples were also obtained during their second visit to the same part of North-eastern Queensland in 1889.

Dr. Elliot Coues has pointed out that the generic name of *Scenopæus*, proposed by Dr. Ramsay for the reception of this species, was preoccupied in Entomology by Agassiz in 1847. Dr. Coues has therefore substituted the name of *Scenopæctes dentirostris* for the Tooth-billed Bower-bird. In habits this species appears to form a connecting link between the true bower-builders and the Cat-birds.

Mr. Robt. Grant, Assistant Taxidermist in the Australian Museum, has furnished me with the following information:—"I found the Tooth-billed Bower-birds freely distributed throughout the scrubs in the mountain ranges of the Upper Russell, the Upper Mulgrave, and the Upper Barron Rivers. In the table-lands in the neighbourhood of Boar Pocket and Lake Eicham, about thirty miles from Cairns, they are the commonest birds in the bush. Usually I found them feeding in the tall fig-trees, and frequently in company with the Spotted Cat-bird (*Eluretus maculosus*). They were seldom met with on the low-lands, but on one occasion I shot a pair in a fig-tree opposite Double Island, about three miles from the coast. The play-ground of this species is formed by clearing a space, from three to five feet across, of all sticks and leaves, and placing thereon freshly-gathered large green leaves of one particular kind of tree. These leaves averaged from forty or fifty to a hundred or more in number, and on some of the play-grounds I found a great accumulation of dead leaves forming a ring around them, and in several instances over a foot in height. These 'circus-rings,' as we called them, were evidently



TOOTH BILLED BOWER BIRD.

made by the birds throwing or scraping the withered leaves from the frequented portion of the playground. Some are found amongst a dense undergrowth of young palms and lawyer canes; others in open parts of the scrub. During my two trips I must have seen over a hundred of them, but I never found one except in the mountain ranges. These birds generally assemble at the play-grounds early in the morning, and again in the afternoon. Usually three or four birds were seen playing about them, picking up the leaves and tossing them about or turning them over; or gamboling and chasing one another. All the while another bird perched in a bush close by was pouring out its loud and melodious notes, which are uttered very rapidly and continuously without intermission, for some considerable time. The leaves are thrown from the centre to the outside of the ring, all withered ones being placed on the edge of it. Fresh leaves are picked and used for their evolutions every day. In addition to its rich and varied notes, it is also possessed of ventriloquial powers, which render it exceedingly difficult to locate, even when singing near at hand. The contents of the stomachs of those I examined contained various fruits, berries, and the remains of Coleopterous insects."

The late Mr. W. S. Day, of Kuranda, near Cairns, Queensland, kindly supplied me with the following notes:—"Relative to this species, the Tooth-billed Bower-birds are very common in the thick scrub lands about the Russell, Mulgrave, and Johnstone Rivers, in North-eastern Queensland, and are far more frequently met with in the ranges than the low-lands. They are usually associated in small flocks, and may be often seen in company with the Spotted Cat-bird (*Elurædus maculosus*) feeding on the different fruits and berries which constitute their food. At the end of June they begin to mate, and go about in pairs only. The play-ground of this species is a very simple one. Clearing a space about three feet in diameter of all sticks and leaves, and usually between two small trees, they place fresh green leaves flat on the ground in the centre of the circle. This is resorted to by from two, to ten or twelve birds, who toss or move the leaves about, and make a great noise, but, unlike Newton's Bower-bird, never fight at the play-ground, although they do so frequently with each other when feeding in the trees. The green leaves vary from ten to over a hundred, according to the number of birds frequenting the play-ground, which is resorted to all the year round. I forward you all the green leaves taken from one measuring three feet four inches in diameter, that I found in the scrub on the Upper Russell River, on the 18th September, 1891. They are twenty-eight in number, and in the centre of the circle were two deep, being more scattered around the edge."

The leaves are long, varying from six to ten inches in length, and from one and a half to two inches in breadth. Mr. F. M. Bailey, F.L.S., Colonial Botanist, Queensland, has kindly identified them as the leaflets of a tree described by him as *Nephelium callarie*. In an extract forwarded, Mr. Bailey states that "Callarie" is the aboriginal name of the tree at the Upper Barron River, where he collected the specimens in June, 1889. He describes it as "a graceful erect tree, about fifty feet high; in all parts, except the upper side of leaflets, thinly covered with a light pulverulence. Upper side of leaflets green, glabrous, under side almost white."

Of the habits of these birds further north, Mr. Frank Hislop writes me as follows:—"In the Bloomfield River District, the Tooth-billed Bower-birds are only found in the scrub on the lofty mountain ranges. They generally have their play-ground in the dense undergrowth. First, a small space about two or three feet in diameter is cleared of all dead leaves and rubbish, and then from about thirty to fifty fresh green leaves are placed thereon, with their white under sides uppermost. I think they must change the leaves very often, as one never sees any withered leaves on the play-grounds frequented by these birds. They are excellent mimics of the notes of other species. 'Bartchal' is the aboriginal name for them in this district."

Immature birds have the upper parts, wings, and tail brown, slightly washed with olive, which is more distinct on the upper back; all the under surface white, tinged with fulvous, the feathers being narrowly margined with dark brown except on the centre of the abdomen. Wing 5·5 inches.

Genus *ÆLURÆDUS*, Cabanis.

Ælurædus viridis.

CAT-BIRD.

Gracula viridis, Lath., Ind. Orn., Suppl., p. xxviii, (1801).

Ptilonorhynchus smithii, Gould, Bds. Austr., fol., Vol. IV., pl. 11 (1848).

Ælurædus smithii, Gould, Handbk. Bds. Austr., Vol. I., p. 446 (1865).

Ælurædus viridis, Sharpe, Cat. Bds. Brit. Mus., Vol. VI., p. 385 (1881); North, Rec. Aust. Mus., Vol. I., p. 111, pls. xii. and xiii. (1891).

ADULT MALE—General colour above grass-green, the crown of the head and hind neck washed with olive, and having a narrow white streak in the centre of each feather; quills and upper wing

* Queensld. Agric. Journ., p. 388, October, 1889.

coverts grass-green; the median and greater wing-coverts, also the secondaries with a spot of white at the tip of their outer webs; inner webs of the outer secondaries and of the primaries blackish-brown, the apical portion of the outer webs of the primaries except the two innermost feathers bluish-green; tail grass-green, all but the two central feathers tipped with white, the lateral feathers blackish-brown on their inner webs, and increasing in extent towards the outermost feather, which is only slightly washed with green on the outer web; sides of the face and ear-coverts dull olive-green minutely spotted with black; the tips of the ear coverts blackish; on the sides of the neck a small patch of white feathers; throat dull grey washed with olive, and spotted with white; remainder of the under surface olive-green with a lanceolate yellowish-white marking in the centre of each feather on the chest and breast, and which lengthens out into a narrow lanceolate shaft stripe on the feathers on the lower sides of the body; centre of the abdomen and under tail coverts yellow slightly tinged with olive; bill light bluish-horn colour, whitish at the tip; legs and feet fleshy-brown; iris reddish-brown. Total length in the flesh 12·5 inches, wing 6·6, tail 5·1, bill 1·1, tarsus 1·8.

ADULT FEMALE.—Similar in plumage to the male.

Distribution. —South-eastern Queensland, Eastern New South Wales.

ALTHOUGH found in the south-eastern portions of Queensland, the luxuriant brushes of New South Wales are the stronghold of this species. It is abundantly distributed throughout the northern coastal districts of the Tweed, Brunswick, Richmond, Clarence, and Bellinger Rivers. Farther south it is sparingly dispersed in favourable situations as far as that rich belt of sub-tropical vegetation which commences near Lake Tuggerah and suddenly ceases a few miles north of the Hawkesbury River. It is not met with in the adjoining country of Cumberland, except near its southern boundary where a similar vegetation is found, in the neighbourhood of Waterfall, Otford, and Bulli. Gradually its numbers increase, and it is again very plentiful in the damp scrubs at Cambewarra and Kangaroo Valley in the Hawarra District, its range extending throughout the coastal districts to very near the southern boundary of the State. During the winter months, at Ourimbah and Wyong, it congregates in large flocks to feast upon the wild fruits and berries, and is often seen feeding in company with the Satin Bower-bird. Unlike the Satin Bower-bird, however, whose range extends inland as far as the western slopes of the Blue Mountains, the Cat-bird, which frequents similar situations, is entirely restricted to the coastal brushes.

The food of this species consists of wild fruits and berries. It is very fond of the seeds of the Bangalow Palm (*Seaforthia elegans*), and of the Cabbage Palm (*Livistona australis*); also of the berries of the introduced ink-weed (*Phytolacca octandra*).

At Ourimbah these birds are occasionally caught in the traps or 'cribs' set for the Little Green Pigeon (*Chalcophaps chrysoclora*). They are also shot for food, and their flesh is said to be white and tender like that of the Wonga Pigeon.

The peculiar and extraordinary notes of this species resemble more than anything else, the long drawn out plaintive cries of the domestic cat.

Although the Cat-birds are usually included in the family of bower-building birds, I have never heard of any species, either in Australia or New Guinea, constructing a bower, or even decorating a cleared space in the scrub with leaves like *Scenopactes dentirostris*. There is a marked difference, too, between the nests and eggs of the Bower-birds and Cat-birds inhabiting Australia. The nests of the former are scanty and somewhat primitive structures formed of sticks or twigs, and only in one instance—that of the Satin Bower-bird—are they lined at the bottom with leaves. Their eggs, however, are noted for the beauty of their markings, especially those of the different species of the genus *Chlamyodora*, and *Sericulus melinus*. The nests of the two species of Cat-birds are compact bowl-shaped structures, beautifully formed of twigs, stems of climbing plants, and long broad leaves. On the other hand their eggs are almost colourless,

and entirely devoid of markings, and are among the very few uniformly coloured eggs laid in open nests by the larger Australian passerine birds.

The nest of this species is a bowl-shaped structure, composed exteriorly of long twigs and stems of climbing plants entwined around a thick layer of long broad leaves, intermingled in some instances with a few pieces of moss, the inside being lined with fine dried twigs. An average nest measures externally eight inches and a quarter in diameter by five inches and a half in depth; the inner cup five inches in diameter by three in depth. It is usually built in a three or more pronged upright fork near the top of a low tree, and frequently one that is hidden with a leafy mass of vines, at varying heights from twelve to forty feet from the ground.

During my visit to the Upper Clarence in November, 1898, a pair of these birds succeeded in rearing their young in a scrub not far from the house. Mr. G. Savidge found several nests containing eggs later on in the same month in the Dundara Scrubs. From one nest the birds made every effort to allure him from the spot, uttering harsh grating cries as they fluttered apparently helpless along the ground, and feigned a broken leg or wing. The previous year,

in the Cangai Scrubs, he found these birds remarkably shy, not venturing into sight even when he was robbing their nests.

In these localities, nests with eggs are usually found in November and December.

Mr. W. J. Grime obtained the first nest and egg of this species I had seen, in the Tweed River District, on the 4th October, 1890. The nest was built in a three-pronged fork of a tree about fourteen feet from the ground, and contained two slightly incubated eggs. On the 8th November following, Mr. Grime found another nest which the bird would not leave until fairly shaken out, when he discovered it



NEST AND EGGS OF CAT-BIRD.

contained two young ones, apparently hatched about a couple of days. Mr. H. R. Elvery informs me that near Alstonville, in the Richmond River District, this species sometimes builds in a tree overgrown with lawyer-vines, and that he has found its nests in a tree-fern, and on the top of a bird's-nest fern growing on the side of a tree. On two occasions he found nests containing only one incubated egg in each. The nest figured, which contained two fresh eggs, was taken by Mr. Elvery on the 13th December, 1898.

At Oarumbah, I saw these birds building on the 25th November, 1898. In this district the leaves of the Native Tamarind (*D. ploglottis cunninghamii*) are used by this species in the construction of its nest.

The eggs of the Cat-bird are usually two, sometimes three in number for a sitting. They vary in form from oval to elongate-oval, some specimens tapering sharply towards the smaller end, the shell being close grained and its surface smooth and glossy. Typically they are of a uniform cream colour, but vary from a rich cream to a pale creamy-white. A set of two, taken by Mr. George Savidge at Cangai, in the Upper Clarence District, on the 11th December, 1897, measures as follows:—Length (A) 1.89 × 1.27 inches; (B) 1.8 × 1.27 inches. Another set:—(A) 1.69 × 1.26 inches; (B) 1.7 × 1.25 inches.

Nestlings have the head and hind-neck covered with smoky-brown down, remainder of the upper surface as in the adults but duller in colour, and only the innermost scapulars with a spot of white near the extremity of the outer web; sides of the face, throat and the neck, bare; lower neck, chest, and sides of the body smoky-grey; centre of the breast and abdomen dull white, with indistinct dull olive-green tips to all the feathers. Wing 4.6 inches. In young birds the throat is greyish-white, with brown bases to the feathers; there are no white streaks on the centres of the feathers of the hind-neck, and the inner secondaries only have a small spot of yellowish-white at the extremity of the outer web; on the sides of the neck there is only an indication of the white patch of feathers, and the centres of the feathers on the lower sides of the body are broadly streaked with yellowish-white. Wing 5.9 inches.

October and the three following months constitute the usual breeding season of this species.

Ælurædus maculosus.

SPOTTED CAT-BIRD.

Ælurædus maculosus, Ramsay, Proc. Zool. Soc., 1874, p. 601; Sharpe, Cat. Bds. Brit. Mus., Vol.

VI, p. 385 (1884); North, Proc. Linn. Soc., N. S. Wales, 2nd ser., Vol. III., p. 147 (1888).

Alurædus maculosus, Gould, Bds. New Guin., Vol. I., pl. 38.

ADULT MALE.—Head and nape blackish-brown, with a rounded subterminal spot of brownish-white at the tip of each feather; the hind neck similar, but slightly washed with green and passing into dull green on the mantle, which is less distinctly spotted with brownish-white; remainder of the upper surface green; the upper back slightly tinged with olive; quills and upper wing-coverts green; the inner series of the median and greater coverts, also the secondaries, with a small spot of white at the tip of their outer webs; inner webs of the outer secondaries and of the primaries blackish-brown; the apical portion of the outer webs of the primaries, except the two innermost feathers, bluish-green; tail green, all but the two central feathers tipped with white, the lateral feathers blackish-brown on their inner webs, and increasing in extent towards the outermost feather, which is only slightly washed with green on the outer web; lores yellowish-white; ear-coverts black, the short upper feathers whitish; lower cheeks yellowish-white; chin black; throat dull white with greenish-brown tips to all feathers, the latter colour more distinct on the fore-neck; remainder of the under surface greenish-brown, with a lanceolate yellowish-white marking in the centre of each feather on the chest and breast, and which lengthens out into a narrow lanceolate shaft-stripe on the feathers of the lower sides of the body; centre of the abdomen and the under tail-coverts yellow, slightly washed with green; bill light bluish-horn colour at the base, whitish at the tip; legs and feet fleshy-brown; iris reddish-brown. Total length 11 inches, wing 6, tail 4.2, bill 1.05, tarsus 1.5.

ADULT FEMALE.—Similar in plumage to the male.

Distribution.—North-eastern Queensland.

THIS species frequents the dense coastal scrubs and contiguous mountain ranges of tropical North-eastern Queensland, from the Bloomfield River in the north to the neighbourhood of Cardwell in the south, where the type was obtained.

During 1887, and again in 1889, Messrs. E. J. Cairn and R. Grant, collecting on behalf of the Trustees of the Australian Museum, succeeded in obtaining a large series of these birds in the neighbourhood of Cairns, and on different parts of the Bellenden Ker Range.

Regarding this species, Mr. Grant has furnished me with the following notes:—"We found the Spotted Cat-bird all through the scrubs near the coast, procuring specimens within half a mile of the beach, although they are more freely distributed on the table-lands of the Bellenden Ker Range, but are nowhere numerous. Unlike *Alcedo viridis*, we did not find them congregating in large flocks, but from sunrise until almost dusk they would come and go into the various fruit and berry-bearing trees in scattered pairs; their mewling or cat-like note, too, is clearer than that of the southern species. We found they resorted chiefly to a particular kind of tree bearing a lemon-like fruit, of which they seemed exceedingly fond, and were often seen in the same tree in company with the Tooth-billed Bower-bird. The contents of the stomachs of those we examined contained portions of the lemon-like fruit previously referred to, ripe figs, and berries."

From the northern limit of this bird's recorded range, Mr. Frank Hislop writes me: "*Alcedo maculosa* is very common in the mountain scrubs of the Bloomfield River District. Its nest is a large open structure formed of sticks and leaves, and lined inside with thin twigs, and is often placed on the side of the stem of a tree where some small leafy branches have sprouted out, and form a support for it. Two eggs is the usual number laid for a sitting, but I have frequently taken nests containing three, and occasionally one with four eggs, or young birds. These birds live chiefly on wild fruits and berries, and are very fond of the berries of the Stinging-tree."

The nest and eggs of this species were first obtained by Messrs. E. J. Cairn and R. Grant on the 2nd December, 1887, in the fork of a sapling about seven feet from the ground, on the Herberton Road, at a distance of thirty-two miles from Cairns. This nest is a neat bowl-shaped structure, composed of long twigs and broad leaves, lined inside with twigs and the dried wiry stems of a climbing plant; on the outside several large and nearly perfect leaves are worked in, and partially obscure one side of the nest. It measures externally seven inches in diameter by four inches and a half in depth; internal diameter, four inches and three-quarters by two inches and a half in depth. The eggs in this instance were two in number, and nearly true ovals in form, tapering but slightly at one end, the surface of the shell being smooth and slightly glossy; they are of a uniform creamy white, and measure:—(A) 1·67 × 1·11 inches; (B) 1·63 × 1·1 inches. Both parent-birds were procured at the time of taking the eggs, which were in an advanced stage of incubation.

Another nest, which contained three eggs, taken by the late Mr. W. S. Day, near Kuranda, is externally constructed of much stronger material, being formed of thin sticks, twigs, and long dead plant stems entwined around the usual thick layer of leaves intermingled with finer plant stems, the inner cup being lined at the bottom only with fine twigs. External diameter eight inches, depth six inches; the inner cup measuring five inches in diameter by a depth of three inches. This nest is built against a leaning branch, and is held in position by several thin branchlets which grow out of the main stem.

Eggs two or three in number for a sitting, rarely four, varying in form from oval to elongate-oval, some specimens tapering sharply towards the smaller end; the shell, as a rule, being close-grained and its surface smooth and slightly lustrous. In colour they vary from a rich cream to creamy-white. A set of two, taken in the Bloomfield River District on the 20th

October, 1895, measures:—(A) 1.65×1.14 inches; (B) 1.67×1.12 inches. A set of three from the same locality measures:—(A) 1.67×1.15 inches; (B) 1.63×1.09 inches; (C) 1.62×1.17 inches.

Young birds are duller in plumage than the adults, the head and nape is washed with green, and the brownish-white subterminal spot is much smaller; only the inner secondaries are indistinctly tipped with dull white on their outer webs, and the yellowish-white centres to the feathers on the under surface are not so sharply defined; under tail-coverts yellowish-green. Wing 5.5 inches.

October, and the three following months constitute the usual breeding season of this species.

Family ORIOLIDÆ.

Genus ORIOLUS, *Linnaeus*.

Oriolus sagittatus.

OLIVE-BACKED ORIOLE.

Coracias sagittata, Lath., Ind. Orn., Suppl., p. xxvi., (1801).

Oriolus viridis, Gould, Bds. Austr., fol., Vol. IV., pl. 13 (1848); Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 212 (1877).

Mimeta viridis, Gould, Handbk. Bds. Austr., Vol. I., p. 462 (1865).

ADULT MALE—General colour above dull olive-yellow; primaries and their coverts, secondaries, median, and greater wing-coverts blackish brown, externally washed with grey, and narrowly tipped with white, some of the inner greater coverts washed with olive-yellow; tail dark brown, washed with grey, all but the two central feathers narrowly tipped with white on the outer web, and having a large oval spot of white on the inner web, this spot increasing in size towards the outermost feathers; lores blackish-brown; sides of the head, neck, and throat dull olive; centre of the throat and fore-neck grey, with indistinct blackish streaks; remainder of the under surface white, conspicuously streaked with black on the chest, these streaks gradually assuming the form of a narrow tear-shaped marking on the breast and sides of the abdomen; centre of the abdomen and under tail-coverts white; sides of the body washed with dull olive; bill brownish-red; iris red; legs and feet slaty-grey. Total length in the flesh 11.5 inches, wing 6, tail 4.5, bill 1.1, tarsus 0.9.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Queensland, New South Wales, Victoria.

FROM an interesting paper, published in "The Ibis," on the "Birds of North Queensland," by Messrs. H. C. Robinson and W. S. Laverock. I extract the following: "The name of *Mimeta viridis*, hitherto universally used for this species, is unfortunately untenable, being founded on the *Green Grackle* of Latham.* On reading the original description, however, it is obvious that it really applies to the Cat-bird (*Elanoides viridis*). The proper name, then, for the present species is *Mimeta sagittata*, founded on the *Striated Roller* of Latham,† Latinized as *Coracias sagittata*.‡ The specimen on which this name was founded passed into Lord Derby's Collection, and is fortunately still in existence in the Liverpool Museum."

* "The Ibis," 1900, p. 625.

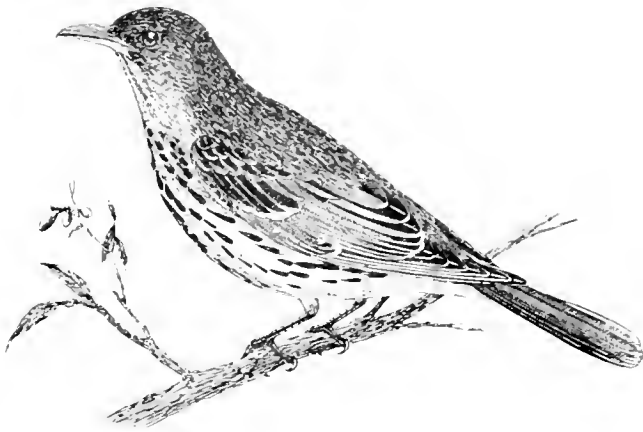
† Gen. Syn., Suppl., II., p. 129 (1801).

‡ Gen. Syn., Suppl., II., p. 122 (1801).

§ Ind. Orn., Suppl., p. xxvi., (1801).

On referring to Latham's Supplement to the "General Synopsis of Birds," and his "Index Ornithologicus," I have verified the previous statement: it is remarkable that the error remained so long undiscovered.

The range of the Olive-backed Oriole extends over most parts of Eastern, and South-eastern Australia. Although frequenting open forest lands and mountain ranges in the inland portion of the States, it evinces a decided preference for the rich coastal brushes which afford it an abundant supply of its usual food, consisting of wild fruits, berries, and insects. The fruit of the native fig-trees, and of the introduced ink-weed (*Phytolacca octandra*), found in these localities, are eagerly devoured by this species. It does not, however, limit its attention to wild fruits and berries, for ever since the advent of fruit-growers in Australia, this bird has proved itself to be a notorious orchard marauder, attacking the softer fruits, such as grapes, mulberries, cherries, peaches, figs, bananas, and paw-paws. Specimens are frequently obtained with the plumage stained or dyed with the juice of the mulberry, or ink-weed. From Victoria Mr. Kearland sends me the following note: "The extreme fondness of the Olive-backed Oriole for cultivated fruit was the cause of my paying a special visit to Clayton in search of what was said to be a strange bird, and described as 'being all crimson and very wary.' On



OLIVE BACKED ORIOLE

my arrival at the paddock it used to frequent, I saw the *tata avis* approaching from the direction of a neighbouring orchard, and struck by its peculiar colour, I determined to secure it. After over an hour's hard chasing, I shot what proved to be one of this species with the whole of its plumage stained with mulberry juice."

Usually this bird is met with in pairs, frequenting the topmost branches of the tallest trees, except in the autumn and winter months, when it congregates in flocks. In

July, 1896, large numbers of them appeared in the Corowa District, and at that time were subsisting chiefly on olives. It is possessed of varied notes, some of which are very melodious, and can be heard a long distance away.

The nest is a deep, cup-shaped structure, outwardly formed of long thin strips of stringy-bark, and bark fibre, or the paper-like bark of the *Melaleuca* when procurable, the inside being thickly lined with fine wiry green grass-stems. Some nests are slightly coated with the pale green Bearded Lichen (*Usnea barbata*), or ornamented with the webs and egg-bags of spiders, while others, when built in tea-trees, are outwardly constructed entirely with the white paper-like bark of some species of the latter. An average nest measures externally five inches and a half in diameter by four inches in depth: the inner cup three inches and a quarter in diameter by two inches and three-quarters in depth. It is securely fastened by the rim to a thin horizontal fork near the extremity of a branch, usually of a *Eucalyptus* or *Angophora*, and less frequently of a *Syncarpia* or *Melaleuca*. Generally they are built at a height varying from twenty to sixty feet from the ground, and are difficult to obtain, but in mountain ranges I have known them to be built in saplings almost within hand's reach.

Eggs usually three in number for a sitting, sometimes only two, and rarely four. They vary in form from oval to elongate-oval, the shell being close-grained, smooth, and lustrous. The ground colour is variable, ranging from dull white to creamy-white and rich brownish-white,

others have the ground colour tinged with buff, or are of a uniform cream colour. The most common type are of a pale creamy or brownish-white ground colour, which is uniformly and minutely dotted, spotted, and irregularly blotched with different shades of umber intermingled with similar underlying markings of deep bluish-grey; in some specimens the latter colour approaching almost a pale inky-purple hue, while in others the subsurface markings are entirely absent. As a rule the markings are irregularly shaped, bold, and evenly distributed over the shell, but not infrequently they predominate on the larger end, where an irregular zone or cap is formed. Specimens are sometimes found with the markings only slightly darker than the ground colour, or having them very small but well defined. A set of three measures as follows: (A) 1.38×0.08 inches; (B) 1.4×0.1 inches; (C) 1.37×0.06 inches. A set of two measures: (A) 1.33×0.04 inches; (B) 1.32×0.05 inches. An elongate set of three measures: (A) 1.5×0.09 inches; (B) 1.51×0.09 inches; (C) 1.49×0.02 inches.

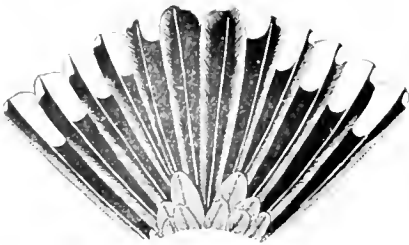
Young birds are greyish-brown above, slightly washed with olive; crown of the head and hind-neck streaked with black; feathers of the upper back with a central or subterminal streak of black, and have pale buffy-brown margins; the upper tail coverts with a subterminal spot of black, and narrowly edged with olive at the tip; quills and upper wing-coverts brown, the primaries and secondaries externally edged and tipped with pale rufous, the greater and median wing-coverts broadly margined and tipped with the same colour; tail greyish-brown, with ashy-white edges to all the feathers, the white spots at the tips of all but the two central feathers extending in a line along either web; sides of the head and neck greyish-brown washed with olive; throat and fore-neck greyish-white with blackish streaks to all the feathers; remainder of the under surface with a blackish-brown streak on the feathers of the chest, and a tear-shaped marking on those of the breast and sides of the abdomen. In a slightly older bird there is a distinct olive-white eyebrow; the upper parts are more strongly washed with olive, and the crown of the head and the back is distinctly streaked with black; the tail-feathers have lost their whitish edges, and the white spots at the tips of all but the two central feathers are smaller; the median and greater wing-coverts are broadly margined with pale rufous, and the primaries and secondaries are externally edged with pale buffy-white, and narrowly tipped with white. Wing measurement the same as that of the adult bird, 6 inches.

In the neighbourhood of Sydney, nidification begins about the latter end of September, and lasts ten or twelve days, the eggs being usually deposited by the end of the second week in October. At Lithgow, on the Blue Mountains, 3,000 feet above the sea-level, Mr. R. Grant also found new nests ready for the reception of eggs early in October. Nests, however, with fresh eggs are more often obtained during the latter end of that month or early in November, and the breeding season continues until the end of January. These birds are persistent breeders, and will build again in the same locality after being repeatedly robbed. A nest containing two eggs was taken at Chatswood, near Sydney, from a Turpentine-tree (*Syncaesia laurifolia*), on the 22nd October, 1898. Three eggs were taken from a nest belonging to the same pair of birds on the 8th November, and a few days after the birds were busy constructing a third nest in a tree in the same locality.

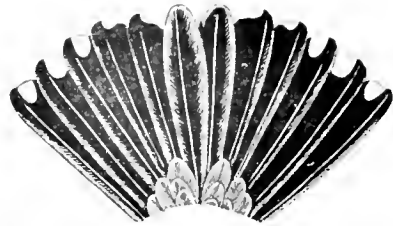
Gould separated a smaller race of these birds from Northern Australia under the name of *Oriolus affinis*. That some of the specific characters of *Oriolus sagittatus* are influenced by its geographical distribution is apparent when one compares a large series of these birds procured in different latitudes. For, the further north the specimens are obtained, it will be found that they are slightly smaller in size, the bill is larger, the white terminal marking on the inner web of the outer tail-feathers is smaller, and the narrow white tip to the outer web is entirely lost. Adult males from Cairns and Cooktown, in North-eastern Queensland, are almost intermediate in size between the two forms, *O. sagittatus* and *O. affinis*, measuring in total length 10 inches, wing 5.9, bill 1.15, extent of the white terminal marking on the inner web of

the outer tail-feather 0·7 inches, and having only a slight indication of the narrow white tip to the outer web. Adult males from Cape York and Port Darwin have a white spot only at the tip of the inner web of the tail-feathers, and their wing measurement is 5·7 inches, and the wing and tail is not so strongly washed with grey as examples from Eastern Australia. A fully adult male, collected at Derby, North-western Australia, by Mr. E. J. Cairn in 1886, has the wings and tail brown, without any greyish wash on the feathers, and there is only a slight indication of the whitish edges to the tips of the quills. It measures in total length 9 inches, wing 5·7, tail 4, bill 1·3; extent of white spot on inner web of outer tail-feather, and which does not reach to the shaft, 0·42 inches. A typical specimen of an adult male of *O. sagittatus*, shot near Sydney, measures in total length 11 inches, wing 6, tail 4·5, bill 1; extent of white terminal marking to inner web of outer tail-feathers, which reaches to the shaft and around the tip of the outer web, 0·9 inches.

Now, comparing examples obtained in New South Wales with those from North-western Australia and Port Essington, or even Cape York, one would naturally conclude that Gould was correct in regarding them as two distinct although closely allied species, *O. sagittatus* inhabiting the south-eastern portions of the continent, and *O. affinis* being its smaller northern and north-western representative. In the intergradation, however, that takes place between these two races, it is apparent that examples from the neighbourhood of Cairns and Cooktown must be regarded as belonging to an intermediate form, but to characterise the birds from this part of the continent even as a subspecies would be absurd. Similar instances of the gradual



Tail of *Oriolus sagittatus*.



Tail of *Oriolus affinis*.

decrease in size of a species, and increase in the length of its bill, is afforded by *Collyriocincla rufigaster*, found in New South Wales and Queensland, and its diminutive and close northern ally *C. parvissima*; also by *Philemon citreogularis*, and its northern and north-western representative *P. sordidus*.

In the "Catalogue of Birds in the British Museum," Dr. Sharpe does not regard either *Oriolus affinis* or *Collyriocincla parvissima* as distinct species, although the learned author ranks several of our Australian birds as good species on less slender grounds. Authorities are divided in opinion as to what is a sufficient character to constitute a species, or subspecies, and have been classed as either "lumpers" or "splitters." Personally, I favour the former, for in a large island-continent like Australia, where geographical distribution and climatic influence are such important factors in the character of a species, it would render the study of birds impossible if each tinge or shade in colour of plumage from different latitudes were accorded subspecific distinction. During a period of twelve years, I have characterised three very distinct subspecies, but were I to separate from different localities each race that varies from the average type in size and depth of colour, the described Australian forms would be considerably more than twice the number they are at present. To do so, however, Ornithologists without the aid of a specimen being properly localised, and of a large reference collection only to be found in a Museum, and possibly a few private collections, would be hopelessly involved in trying to distinguish the various climatic forms of a species. Taking *Oriolus sagittatus* as an

example, one could pick out three distinct races from the typical form. An examination of a large series from different latitudes would prove, however, that they gradually merge into one another. Leaving the increase in the length of bill out of the question, the decrease in the white terminal marking of the tail feathers is shown on the preceding page from a photograph of the tails of two fully adult males obtained in widely separated localities. One is the figure of the tail of an adult male of *Oriolus sagittatus* shot near Sydney; the other is that of Gould's smaller race, or subspecies, *O. affinis*, procured at Derby, North-western Australia.

A set of two eggs, taken near Port Darwin, cannot be distinguished from typical eggs of *O. sagittatus*, but are slightly smaller. They measure: (A) 1.3×0.87 inches; (B) 1.3×0.9 inches.

Oriolus flavicinctus.

YELLOW-BELLIED ORIOLE.

Mimetes flavocinctus, King, Surv. Intertrop. Coasts Austr., Vol. II., p. 119 (1827).

Oriolus flavocinctus, Gould, Bds. Austr., fol., Vol. IV., pl. 14 (1848).

Mimeta flavocincta, Gould, Handbk. Bds. Austr., Vol. I., p. 466 (1865); Salvad., Orn. Pap. et Molluc., Pt. II., p. 471 (1881).

Oriolus flavicinctus, Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 206 (1877).

ADULT MALE—General colour above olive-yellow, the feathers on the crown of the head streaked with black, and those of the back having a narrow arrow-shaped marking of black in the centre; lesser wing-coverts like the back; the median, greater, and primary coverts black, washed with olive, and largely tipped with yellow; primaries black, externally edged with olive and tipped with yellowish-white; the secondaries similar, but more conspicuously margined with olive-yellow on their outer webs; tail feathers black, washed with greenish-yellow on their outer webs, and tipped with yellow, which increases in extent towards the outermost feather; sides of the head and neck, and all the under surface olive-yellow, passing into a clearer yellow on the centre of the abdomen and under tail coverts; bill dull red; legs and feet bluish-lead colour; iris red. Total length 11 inches, wing 6, tail 4.5, bill 1.5, tarsus 1.

ADULT FEMALE—Differs from the male in its smaller size, and in having all the feathers of the crown of the head and back more broadly streaked with black; a distinct eye-brow olive-yellow; under surface olive-yellow, conspicuously streaked with black down the centre of most of the feathers; primaries, secondaries, and upper wing-coverts brown, with straw-white instead of yellow tips to the feathers; tail feathers brown, washed with olive-green, the yellow tips being much paler and smaller than in the male. Total length 10.5 inches, wing 5.5, tail 4.5, bill 1.25, tarsus 1.

Distribution.—Northern Territory of South Australia, Northern and North-eastern Queensland, Aru Islands.

THIS species is freely distributed in suitable localities over the northern and north-eastern portions of the Australian continent, numerous specimens having been obtained by various collectors at Port Darwin, Port Essington, Cape York, and throughout the coastal districts of North-eastern Queensland as far south as Cairns. It has been recorded from Port Denison, but I have never seen a specimen that was obtained south of Cardwell. It also occurs in the Aru Islands.

It is essentially an inhabitant of the rich coastal brush and contiguous mountain ranges, and is never met with far inland. Mr. R. Grant informs me that while collecting on behalf of the Trustees of the Australian Museum in December, 1888, he met with it at Riverstone, at a

sixteen miles from Cairns, in small flocks from five to seven in number, feeding in company with *Calornis metallica*, on the berries of a tree. At that time the plumage was much abraded, and he found it useless shooting them for specimens.

Writing from the Bloomfield River District, in North-eastern Queensland, in October, 1896, Mr. Robert Hislop, Junr., sends me the following note: "*Oriolus flaviventris* is a partial migrant, arriving here generally at the end of June, and departing again about the end of February. Some seasons they are more numerous than others, and when there is an abundance of native fruits and berries many of them remain throughout the year. Owing, however, to the comparatively light rainfall during the last three years, and the consequent dearth of their food supply, these birds have been unusually scarce, and what few visited us soon took their departure for some more rain-favoured district. When they remain to breed, they are usually found about lagoons and in the mangroves along the banks of rivers and creeks. The nest is an open cup-shaped structure, and is built at the junction of a thin forked twig at the extremity of a horizontal branch, usually of a *Melaleuca*, and frequently in one overhanging a water-hole or salt-water creek, at an altitude from twenty to forty feet. It is formed of long strips of tea-tree bark and bark-fibre, and lined inside with very fine twigs. Two eggs are laid for a sitting. The months of November, December, and January, constitute the usual breeding season."

A nest of this species, taken about eight miles from Cooktown, is an open cup-shaped structure, and is securely fastened by the rim to a thin forked horizontal branch. It is outwardly formed of long strips of tea-tree bark, bark-fibre, thin dried leaves, plant tendrils, and a small quantity of spider's-web, the inside being lined entirely with fine plant twigs; externally its average measurements are six inches in diameter by three inches in depth, the inner cup measuring three inches and a half in diameter by two inches in depth. The eggs vary in shape, colour, and disposition of their markings, as do those of *Oriolus sagittatus*, which they closely resemble, especially those taken in the northern portions of the continent, from which they cannot be distinguished. A set of two, taken in the Bloomfield River District, on the 10th December, 1894, are oval in form and slightly pointed at the smaller end, the shell being close grained, and its surface smooth and glossy. They are of a uniform pale creamy-brown ground colour, which is irregularly blotched and finely dotted with rich umber-brown, and a few similar underlying markings of dull inky-grey. Length: (A) 1.268 × 0.92 inches; (B) 1.25 × 0.92 inches. Another set of two, taken near Cooktown on the 2nd December, 1899, have the ground colour of a pale brownish-white, one specimen being heavily blotched and finely dotted with different shades of umber-brown, and a few subsurface markings of blackish-grey; on the other the markings are much smaller, darker, and rounded in shape, some of them being in clusters, others are in straight lines, the underlying blackish-grey markings being more numerous, and forming an ill-defined zone on the larger end. Length: (A) 1.23 × 0.92 inches; (B) 1.25 × 0.93 inches.

Dr. A. B. Meyer, Director of the Dresden Museum, who has contributed so largely to a knowledge of the Papuan avifauna, also of the nests and eggs of many birds common alike to Northern Australia and New Guinea, described and figured the eggs of the present species many years ago. In the same publication there is also a description and figure* of the egg of another well-known North Australian species, *Craicticus quoyi*, Quoy's Butcher-bird.

* Zeitschr. f. ges. Orn., i., p. 202, pl. xvii., fig. 1 (1884).

† *Opusc.*, p. 283, pl. xviii., figs. 2-4 (1884).

Genus SPHECOTHERES, Vieillot.

Sphecotheres maxillaris.

FIG-BIRD.

Turdus maxillaris, Lath., Ind. Orn., Suppl., p. xliii., (1801).*Sphecotheres australis*, Gould, Bds. Austr., fol., Vol. IV., pl. 15 (1848).*Sphecotheres maxillaris*, Gould, Handbk. Bds. Austr., Vol. I., p. 467 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 224 (1877).

ADULT MALE.—General colour above yellowish-green; upper wing-coverts like the back; primaries black, externally edged with ashy-white; secondaries black, broadly margined with yellowish-green on their outer webs, the innermost feathers yellowish-green on the outer web, black on the inner; tail black, the lateral feathers tipped with white which increases in extent towards the outermost feather, the outer web of the latter white except at the base; crown of the head, nape, and ear-coverts black; hind neck, throat, and fore-neck leaden grey, remainder of the under surface dull yellowish-green; centre of the lower abdomen and under tail-coverts white; bill black; legs and feet pale fleshy-brown; bare space around the eye, and iris, red. Total length in the flesh 11 inches, wing 6·2, tail 4·5, bill 0·92, tarsus 1.

ADULT FEMALE.—General colour above brown; the lower rump and upper tail-coverts washed with greenish-olive; wings brown, the primaries narrowly edged externally with dull ashy-white; the median and greater wing-coverts and secondaries washed with greenish-olive on their outer webs; tail brown, washed with greenish-olive except on the lateral feathers, which are margined with white at the tips of the inner webs; throat, sides of the neck, and fore-neck brownish white, broadly streaked with brown; remainder of the under surface white, conspicuously streaked with brown; centre of the abdomen white; sides of the body tinged with greenish-olive; under tail-coverts white, with brown shaft-streaks. Total length 11 inches, wing 6·5, tail 4·5, bill 0·95, tarsus 1.

Distribution. Eastern Queensland, North-eastern New South Wales.

THE Fig-bird is a resident species, and is plentifully dispersed throughout the rich coastal scrubs and brushes of South-eastern Queensland and North-eastern New South Wales. In the latter State, on rare occasions, specimens have been obtained as far south as the neighbourhood of Sydney.

During my visit to the Clarence River District, I found it usually in pairs, and fairly numerous, frequenting chiefly the taller trees in open forest lands, or near the margin of scrubs. Just about dusk, these birds would resort to the low Bean-trees (*Castanospermum australe*), and brushes on the river banks, uttering their peculiar parrakeet-like notes, as they playfully chased each other from branch to branch. Locally, about Copmanhurst, it is known as the "Red-eye," and in some parts of New South Wales and Queensland, as "Mulberry-bird," "Fig-bird," or "Banana-bird," according to the different kinds of fruit it feasts upon.

Gould describes and figures the bare space around the eye of the adult male of this species as being pale buffy-yellow. It is this colour in the winter months, or has only a few minute reddish warty excrescences on it, but during the breeding season and the summer months this part is of a uniform rich red.

The usual food of this species is derived from the many wild fruit and berry-bearing trees which flourish in its haunts. Chief among these are the fruits of the different species of *Leucos*, the native cherry, and in the northern coastal districts of New South Wales the berries of the introduced ink-weed (*Phytolacca octandra*). Among cultivated fruits, it chiefly attacks mulberries, figs, bananas, paw-paws, loquats, and guavas.

* Bds. Aust., fol., Vol. iv., p. 15 (1848).

The nest is an open shallow structure, formed of vinelets or long pliant stems of climbing plants, with which are intermingled a few fine twigs. It is usually built in the forked horizontal leafy twigs near the extremity of an outspreading branch, and well away from the trunk of the tree. Although apparently of a flimsy character, for the eggs are generally visible through the bottom of the nest, the rim is securely worked over the twigs or branchlets, and the whole structure has a wire-like consistency and is remarkably strong. An average nest measures externally six inches in diameter by two inches and a quarter in depth: internally four inches and three-quarters in diameter by two inches and a quarter in depth. In the Upper Clarence District the trees mostly favoured as nesting-sites are apple-trees, bloodwoods, ironbarks, and grey gums. Generally their nests are built at a height varying from thirty to seventy feet from the ground.

The eggs are usually three in number for a sitting, and vary much in form and colour. Oval and elongate ovals are the most common types, while rounded ovals are sometimes found, the shell being close-grained and its surface smooth and slightly lustrous. The ground colour



NEST AND EGGS OF FIG-BIRD

varies from very pale apple-green to dull olive-green, some specimens being of a much lighter shade at the smaller end, but as a rule the ground colour is uniform. Irregular-shaped blotches, spots, and freckles of different shades of reddish-brown, or purplish-red, and similar underlying markings of purplish-grey are distributed over the shell, but particularly on the larger end, although they rarely assume the form of a zone. In some specimens there is a reddish wash on the larger end, or the markings thereon are penumbral, but generally they are clear and well-defined. Typical eggs resemble those of *Cracticus destructor* more than any other species. A set of two, taken in the Richmond River District in November, 1886,

measures as follows:—Length (A) 1.28 × 0.95 inches; (B) 1.29 × 0.95 inches. A set of three, taken at Copmanhurst, on the 16th November, 1898, measures:—Length (A) 1.28 × 0.95 inches; (B) 1.29 × 0.95 inches; (C) 1.3 × 0.97 inches. A remarkably handsome set of three eggs, taken by Mr. Clarence Savidge on the same day, and the largest I have seen, measures:—(A) 1.45 × 0.92 inches; (B) 1.45 × 0.9 inches; (C) 1.45 × 0.92 inches. The ground colour of this set is a very pale apple-green, which is distinctly dotted and spotted with different shades of purplish-red, and similar underlying markings of purplish-grey, intermingled with a very few irregular shaped blotches on the larger end of the shell.

This species is a comparatively late breeder. While driving from South Grafton, on the 3rd November, 1898, Mr. George Savidge drew my attention to a pair of these birds busily engaged in constructing their nest in a Bloodwood (*Eucalyptus corymbosa*) near the roadside. This was the first nest he had found that season. Subsequently, at Copmanhurst, I found two

pairs similarly engaged, one on the 7th, the other on the 9th November. Both nests were about half-built, and were placed near the extreme leafy ends of horizontal branches of the Rough-barked Apple (*Angophora subvelutina*), at a height of seventy feet from the ground. On the 16th November, from each of these nests, after climbing to the limb on which they were built, Mr. Clarence Savidge successfully scooped a beautiful set of three fresh eggs; a difficult feat to perform owing to the foliage surrounding the nests, and a strong wind blowing at the time. The eggs were deposited daily, and could be clearly seen from the ground. One of the females left the nest directly we approached the tree, the other remained sitting until preparations were made to scoop the eggs. It is the nest and eggs of the latter bird figured. Another pair made repeated swoops at the rope as it was thrown over the branch on which the nest was built.

Nidification, Mr. George Savidge informs me, sometimes begins as early as the middle of October, and the nest is completed in about ten days. Nests with eggs, however, are more frequently found during November and the following month. In some seasons he has observed these birds building in January, and has taken a set of fresh eggs as late as the 28th January, 1901.

Sphecotheres flaviventris.

YELLOW-BREADED FIG-BIRD.

Sphecotheres flaviventris, Gould, Proc. Zool. Soc., 1849, p. 111; *id.*, Handbk. Bds. Austr., Vol. I., p. 468 (1865), *id.*, Bds. Austr., fol., Suppl., pl. 37 (1869); Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 225 (1877); Salvad., Orn. Pap. et Mollucc., Pt. II., p. 480 (1881).

ADULT MALE—*General colour above greenish-yellow; upper wing-coverts like the back; primaries black, externally edged with ashy-grey; secondaries black, broadly margined with yellowish-green on the outer web, the innermost feathers yellowish-green on the outer web, black on the inner; tail black, the lateral feathers tipped with white, which increases in extent on the outermost feather, the outer web of the lateral feathers white except at the base; crown of the head, nape, and earcoverts black; throat, sides of the neck, and all the under surface bright yellow; sides of the chest yellowish-green; centre of the lower abdomen and under tail-coverts white; bill black; legs and feet flesh colour; bare space around the eye reddish-yellow; iris reddish-brown. Total length 10 inches, wing 6, tail 4.5, bill 0.9, tarsus 0.9.*

ADULT FEMALE—*General colour above brown; feathers of the head light brown with darker brown centres; rump and upper tail-coverts brown, washed with olive-yellow; quills and their coverts brown, all the feathers narrowly edged with ashy-grey, the edges of the outer webs of the greater coverts and outer secondaries distinctly tinged with olive-yellow; tail brown, the two central feathers and the outer webs of the remainder washed with olive-green; sides of the neck, the throat and fore-neck brownish white, broadly streaked with brown; remainder of the under surface white tinged with olive yellow, and conspicuously streaked with dark brown; centre of the lower abdomen white; under tail-coverts white, narrowly streaked down the centre with dark brown. Total length 10 inches, wing 6, tail 4.5, bill 0.9, tarsus 0.9.*

Distribution.—Northern Australia, Eastern Queensland, Ke Islands.

THIS species was discovered at Cape York by the late Mr. John MacGillivray, during the stay there of H.M.S. 'Beagle,' while engaged in making a survey of the north-eastern coast of Australia. It is abundantly distributed throughout the coastal districts of North-eastern Queensland, from Cape York to the neighbourhood of the Herbert River. Mr. J. A. Thorpe and Mr. George Masters found it plentiful at Cape York; and specimens were also obtained there by members of the 'Challenger' Expedition in September, 1874. In the "Report of the Voyage of the Alert," Dr. Sharpe records it from Thursday Island. It is common at Cooktown and the Bloomfield River District, where it has been found freely

breeding by Mr. E. Olive, and Messrs. Robert and Frank Hislop. In the Australian Museum collection it is represented by a number of skins obtained at Cape York by Mr. J. A. Thorpe, and specimens procured at Cairns by Mr. K. Broadbent and Messrs. E. J. Cairn and Robert Grant. Mr. G. Masters also obtained a female on Palm Island, some distance south of the Herbert River, the southern limit of its range. In a north-westerly direction it has been recorded from the mouth of the Norman River, which flows into the Gulf of Carpentaria, in a collection of birds formed there by Mr. Gulliver. I can find no record of it being observed west of this locality, and neither of the large collections formed by Mr. Alexander Morton at Port Essington and Port Darwin, contained an example of this species. Mr. A. Zietz, however, has forwarded me a list of birds that were collected in the Northern Territory by the late Mr. F. Schultze, and received at the South Australian Museum, Adelaide, in March, 1870. They were identified by the late Curator, Mr. F. Waterhouse, and among them are included ten specimens of *Sphæcotheres flaviventris*. In a paper on the collection of birds made by Dr. Lotia, near Port Darwin, Count Salvatori refers a single specimen obtained as a female of *S. maxillaris*. I believe, however, that it will prove to belong to the present species. It is remarkable that this



YELLOW-BREASTED FIG-BIRD.

bird, so common on the Cape York Peninsula, is not found in New Guinea, although easy access is given between the latter island and the Australian continent through the numerous islets dotted about the intervening hundred miles expanse of Torres Strait. Singular, too, that it should be found in the Ke Islands, in the Banda Sea, about eight hundred miles in a north-westerly direction from Cape York, and yet be absent in the intermediate Aru Islands.

At Cairns, in North-eastern Queensland, Mr. R. Grant informs me, the Yellow-breasted Fig-birds were seen in the tall fig-trees feeding in company with other species; and the stomachs of those he examined contained various kinds of wild fruits and berries.

Relative to this species, Mr. Frank Hislop writes to me as follows: "In the Bloomfield River District, the Yellow-breasted Fig-bird breeds only in the open forest lands. The nest is an open shallow structure, formed of long pieces of the stems of climbing plants

and twigs, and is generally attached to the end of a drooping branch of a blackbutt-tree, from thirty to fifty feet from the ground. Frequently several pairs build in the same tree, and often in company with the Helmeted Friar-bird and Drongo-shrike. Three is the usual number of eggs laid for a sitting, but on one occasion I found a nest containing four. The months of October, November, December, and January constitute the usual breeding season."

The nest is an open, shallow, and neatly made structure of a deep saucer-shape, and is formed of long pliant stems and tendrils of climbing plants, similar to that of *S. maxillaris*; and, like the nest of that species, it is of so scanty a nature that when it contains eggs they are visible through the bottom of the nest. An average nest measures externally five inches in diameter by two inches and a half in depth; the inner cup three inches and a half in diameter by two inches in depth. They are built at the junction of a forked horizontal branch, and generally where several thinner leafy stems sprout out.

The eggs are usually three in number for a sitting, and as might be expected, vary as much in shape, colour, and character of markings as those of the preceding species, from which they cannot be distinguished. In a number of sets now before me, ovals predominate in form, others are slightly compressed towards the smaller end, and some are elongate-oval. The ground colour presents even more variation than in the eggs of *S. mavillaris*, for in addition to the pale apple-green to dull olive-green and brown shades, dull bluish-whites are not uncommon, and some specimens are almost white on the smaller end. As in the preceding species, the ground colour of typical specimens is irregularly blotched, spotted, and freckled with different shades of reddish-brown or purplish-red, many of the markings in some specimens appearing as if beneath the surface of the shell. In one set the dull apple-green ground colour assumes a reddish-brown hue on the larger end, where are several irregular-shaped penumbral blotches of chestnut-brown, intermingled with small dots and spots of the same colour; the remainder of the shell, except for a few minute dots hardly visible to the naked eye, being entirely devoid of markings. Another set, of a pale bluish-white ground colour, is most minutely freckled all over with very pale purplish-red, and having on the larger end of the eggs an irregular zone of small and slightly darker spots; most of the markings on this set have a faded and washed-out appearance, and resemble those on some varieties of the eggs of the acclimatised Greenfinch (*Fringilla chloris*). A set of three, taken on the 15th December, 1894, measures as follows:—Length (A) 1.23×0.9 inches; (B) 1.3×0.9 inches; (C) 1.27×0.89 inches. A set of three, taken on the 20th October, 1894, measures:—(A) 1.25×0.87 inches; (B) 1.23×0.86 inches; (C) 1.26×0.87 inches. An elongate-oval set, taken on the 20th November, 1894, measures:—Length (A) 1.4×0.85 inches; (B) 1.41×0.85 inches; (C) 1.41×0.84 inches. All the above described eggs were taken by Mr. Robert Hislop, Junr., or Mr. Frank Hislop, while resident in the Bloomfield River District, North-eastern Queensland.

Young males are duller in colour than the adults on the upper parts; the head is brown, with darker centres to the feathers, with which are intermingled a number of black feathers; all the under surface yellowish-white, slightly richer and brighter yellow on the throat and fore-neck, most of the feathers on these parts and some on the sides of the body being conspicuously streaked with dark brown down the centre; under tail-coverts white. Wing 5.5 inches. Slightly older birds have most of the feathers of the head and the ear-coverts black; all the under surface bright yellow, the feathers of the throat having very narrow brown shaft-streaks.

Immature females have the feathers of the head dull brownish-white with distinct blackish-brown streaks on the crown and nape; quills and upper wing-coverts dark brown, broadly margined with greyish-white. Some adult females have the feathers of the head much lighter than others, and the dark brown markings on the feathers of the under surface of an elongate tear-shaped form on the lower breast and abdomen; under tail-coverts white, with brown shaft-lines on some of the feathers.

The figure represents an adult male.

Family DICRURIDÆ.

Genus DICRURUS, Vieillot.

Dicrurus bracteatus.

DRONGO-SHRIKE.

Dicrurus bracteatus, Gould, Proc. Zool. Soc., 1842, p. 132; *id.*, Bds. Austr., fol., Vol. IV., pl. 82 (1848).

Chibia bracteata, Gould, Handbk. Bds. Austr., Vol. I., p. 235 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 236 (1877).

Dicruropsis bracteata, Salvad., Orn. Pap. et Molucc., Pt. II., p. 174 (1881).

ADULT MALE—*General colour above black; feathers of the head and sides of the hind-neck tipped with metallic steel-green; rump, upper tail-coverts, wings and tail black, washed with metallic steel-green; all the under surface black, slightly glossed with green, the tips of the feathers of the throat and fore-neck spangled with small spots of metallic steel green; under wing-coverts black, with a rounded spot of white at the tips; bill and legs black; iris red. Total length in the flesh 12.35 inches, wing 6.25, outer tail feathers 5.2, central tail feathers 4.8, bill 1.3, tarsus 0.9.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Northern Territory of South Australia, Queensland, New South Wales, Victoria, Tasmania, New Guinea.

I HAVE included this species in the older genus *Dicrurus*, as the principal characters of the genus *Chibia*, founded on an Asiatic species, are absent in the only representative of this family inhabiting Australia.

The range of the Drongo-shrike extends over the south coast of New Guinea and the greater part of Northern and Eastern Australia. Numerous examples were obtained at Port Darwin by the late Mr. E. Spalding, and it is freely distributed in favourable situations throughout the whole of the coastal districts of Eastern Queensland and the north-eastern portions of New South Wales. Farther south it is seldom met with, except in the autumn, after the breeding season is over, when specimens are sometimes obtained during March, April, and May. Near Sydney it was not uncommon between Newport and Manly in the autumn of 1900, specimens also being procured farther inland at Windsor, Penrith, and Campbelltown. At Lithgow, on the Blue Mountains, at an elevation of over three thousand feet, Mr. Robt. Grant saw about fifty in small flocks in 1875, and obtained several examples. Previously he had not observed them in that locality, nor has he seen any since. It is, however, of a roving nature, and occasional visitants have been obtained in Victoria, and even Tasmania. The wing measurement of adult males from different localities varies from 6 to 6.5 inches.

The Drongo-shrike in New South Wales evinces a decided preference for trees on the edges of scrubs, and is mostly seen in pairs, but not infrequently in small companies, varying from four to six in number, the latter probably a pair of adults accompanied by their progeny, for they are generally seen crowding one against another near the end of a dead branch. When once heard, its harsh and peculiar note cannot easily be mistaken for that of any other species.

In the manner of securing its food it resembles the Dollar-bird, and some species of Wood Swallows, sallying forth from its perch on some dead branch to secure a passing insect, and returning again to the same spot after capturing it. It is not, however, strictly insectivorous, and many of the specimens I have seen were obtained while feasting on cultivated fruits. The stomachs I examined of specimens procured at Bay View, Manly, and at Penrith, were all filled with the heads, legs, and elytra of black beetles, and in one I found a perfect dragon-fly.

The nest, which is attached at the sides to a thin forked stem of an outspreading branch, is a cup-shaped structure formed almost entirely of vine tendrils intermingled with pliant plant stems, and frequently has a quantity of spiders' web worked over the fork in which it is built. An average nest measures externally six inches in diameter by three inches in depth, the inner cup measuring three inches and a half in diameter by two inches in depth.

The nest and eggs figured were taken by Mr. G. Savidge on the 17th November, 1901, at the head of Wombat Creek in the Upper Clarence District. Externally the nest is triangular in form, and is built between and around a thin horizontal forked stem of a box-tree, the rim on one side of the nest standing above the branch. It is formed throughout of long curling vine tendrils and plant stems, and has at each angle a quantity of spiders' web worked over the branch, the inner portion being cup-shaped and neatly rounded. Externally the structure averages six inches in diameter by three inches in depth, the inner cup measuring four inches

in diameter by two inches in depth. It was built at a height of forty feet from the ground, and the eggs—four in number—were visible through the bottom of the nest. The figure is reproduced from a photograph taken, and kindly lent by Mr. Savidge.

The eggs are from three to five in number for a sitting, and vary considerably in shape, colour, and disposition of their markings. In shape they are mostly oval or elongate-oval, some specimens tapering sharply to one or both ends, the shell being close-grained and its surface dull and lustreless. The ground colour varies from faint reddish-white to pale purplish-grey. A common type has a pale purplish-grey ground colour, with numerous irregular shaped blotches, smears, scratches, and freckles of different shades of purplish-red scattered over the shell, and intermingled with faint similar underlying markings of dull violet-grey. In some specimens these markings are clear and well defined; in others they are very faint and hardly distinguishable from the ground colour. Another type has a very pale creamy-buff ground colour, over which is evenly distributed numerous small indistinct freckles and fleecy markings of light red intermingled with underlying spots and freckles of dull violet-grey; in some



NEST AND EGGS OF DRONGO-SHRIKE.

specimens the markings become confluent on the larger end, where an indistinct zone is formed. Others have large underlying clouded patches of faint purplish-red on different parts of the shell. A set of three, taken in the Bloomfield River District, North-eastern Queensland, on the 20th December, 1894, measures:—Length (A) 1.3 × 0.8 inches; (B) 1.31 × 0.81 inches; (C) 1.3 × 0.81 inches. Another set of three, taken on the 11th December, 1895, in

the same district, measures:—(A) 1.22 × 0.87 inches; (B) 1.23 × 0.87 inches; (C) 1.19 × 0.87 inches. A set of three, taken at Broad Sound, on the 10th October, 1882, measures:—(A) 1.2 × 0.83 inches; (B) 1.18 × 0.83 inches; (C) 1.23 × 0.85 inches. A set of eggs taken by Mr. G. Savidge on the 17th November, 1901, are of a faint purplish-white ground colour, which is sprinkled over with numerous small irregular shaped spots, streaks, dashes, and a few large blotches of light red and purplish-red, intermingled with similar underlying markings and clouded patches of pale purplish-red, predominating as usual on the thicker end of the shell. Length:—(A) 1.16 × 0.86 inches; (B) 1.19 × 0.84 inches; (C) 1.16 × 0.86 inches; (D) 1.18 × 0.86 inches.

Mr. C. C. L. Talbot found this species breeding on Collaroy Station, near Broad Sound, Queensland, on the 10th October, 1882. The nests were attached to the fine leafy twigs at the extremities of the branches of dwarf white gums at an altitude of twenty feet from the ground. They were placed in trees about fifty yards apart, and in twelve nests examined each contained three eggs for a sitting. In some the eggs were fresh, in others partially incubated. On the 17th January, 1896, Mr. J. A. Boyd found a nest on the Herbert River, containing three newly fledged young. Still further north, Mr. Frank Hislop writes to me:—“The Drongo-shrike is

very common about the Bloomfield River, and is usually met with in pairs, in the low undergrowth, searching for insects and berries, which constitute its food. They breed from October to January, and often select as a nesting site a blackbutt, or a Moreton Bay Ash, in which the Helmeted Friar-bird and Yellow-breasted Fig-bird have their nests. The nest is composed almost entirely of the curly tendrils of vines, and is suspended by the rim to a thin fork at the end of an overhanging branch. They lay four and often five eggs for a sitting. After the breeding season is over, at the end of February, with nearly every flock of White-bellied Cuckoo-shrikes, will be seen several Drongo-shrikes."

In New South Wales it breeds, so far as I am aware, only in the northern coastal rivers district. I did not meet with it in the Upper Clarence District, but Mr. George Savidge found it breeding in the Cangai Scrubs, about forty miles from Copmanhurst, the week after I left. He informs me that the nests were nearly all built in thin horizontal forks at the extreme ends of branches of box-trees, at a height varying from thirty to forty feet from the ground. In every instance the scoop had to be used to abstract the eggs. It breeds in that locality mostly in November and December, three or four eggs being the usual number laid for a sitting, but on one occasion he found a nest containing five eggs.

Fledgelings are blackish-brown above and below; wings and tail black, slightly glossed with metallic steel-green. Wing 4·8 inches.

October and the four following months constitute the usual breeding season in Eastern Queensland and North-eastern New South Wales.

Family PRIONOPIDÆ.

Sub-Family PRIONOPINÆ.

Genus GRALLINA, Vieillot.

Grallina picata.

MAGPIE-LARK.

Gracula picata, Lath., Ind. Orn., Suppl., p. xxix., (1801).

Grallina australis, Gould, Bds. Austr., fol., Vol. II., pl. 54 (1848).

Grallina picata, Gould, Handbk. Bds. Austr., Vol. I., p. 188 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 272 (1877).

ADULT MALE—General colour above blue-black; upper wing coverts white, the outer series of the greater coverts black tipped with white; quills black, bases and tips of the secondaries white; rump and upper tail-coverts white; tail feathers white, with a broad terminal black band, decreasing in extent towards the outermost feathers which are tipped with white; a broad line above, and a narrow crescent below the eye white; ear-coverts and sides of the neck white; chin, throat, and chest blue black; remainder of the under surface pure white; bill fleshy-white, blackish along the apical portion of the upper mandible; legs black; iris yellowish-white. Total length in the flesh 10·5 inches, wing 6·6, tail 5, bill 0·85, tarsus 1·7.

ADULT FEMALE—Similar to the male in plumage, but having the lores, forehead, and throat white, and no white crescent below the eye.

Distribution.—Northern Territory of South Australia, Queensland, New South Wales, Victoria, South and Central Australia, Western and North-western Australia, Tasmania.

THIS familiar and well-known species is freely distributed in suitable localities over nearly the whole of the Australian continent. It likewise occurs as an occasional visitant in Tasmania, and Mr. E. Hartert has recorded a specimen from the little island of Koer in the Ke Group. It evinces a decided preference for the vicinity of water, and chiefly frequents open forest and grass lands, and the margins of rivers and swamps. In Eastern Australia it is a resident species, and is usually seen in pairs except from the beginning of March until the end of July, when it congregates in flocks numbering from ten or twenty, to perhaps one hundred or more individuals. Mr. Kearland informs me that while the Horn Scientific Expedition was near Francis' Well, in Central Australia, a flock of several hundred of these birds settled at nightfall in the trees around their camp.

Grallina picata was first recorded as a Tasmanian species* from a specimen forwarded by Dr. Lonsdale Holden to the Hobart Museum. From Dr. Holden's MS. notes, under date 15th July, 1888, I take the following extract:—"To-day I shot a female *Grallina picata* on Deavin's Farm at Circular Head. A pair had been observed there near the homestead for some weeks, one of which has since disappeared. They fed on the ground, flying into trees when disturbed, and always roosting in the same clump. This one was tame enough; the crop contained the

remains of insects; the ovary not being large, but plainly recognisable. The farm it frequented is on the shores of a large marine inlet, and very bare of trees. The man who lives there said the birds generally resorted to marshy places in the paddocks. Residents here have never seen this bird before."



MAGPIE-LARK

the "Pee-wee" from its note; and the "Mud-Lark" from its habit of frequenting the margins of swamps, and constructing its nest of mud.

From Port Augusta, South Australia, Dr. A. Chenery sends me the following note:—" *Grallina picata* is here in the winter months, but is not seen as a rule after August. It does not breed here."

The Magpie-Lark passes most of its time on the ground, in search of insects and their larvæ, which constitute the greater portion of its food. It also frequents ploughed lands and orchards for grubs and worms, and from margins of swamps and on grass lands obtains small molluscs. One species of land mollusc, of which it destroys large numbers, is an intermediate host of fluke, that dire disease in sheep. Mr. J. A. Boyd, while resident at Ripple Creek, near Townsville, Queensland, informed me that large flocks of these birds followed the teams while ploughing on the sugar plantations, to feast upon the cane-eating larvæ of a beetle, which are turned from the earth in some seasons in large numbers. Writing on the 14th June, 1872, he

* Bull. Brit. Orn. Club, 1866, p. 101.

† Proc. Roy. Soc. Tas., 1888, p. xxxiii.

remarks:—"Magpie-Larks, which have been absent for three years, are now here in hundreds." And again, on the 24th January, 1896, Mr. Boyd writes:—"The cane-beetles' have been here in millions this season; about £700 has been already spent in buying them from collectors at sixpence a quart. A quart holds about two hundred and twenty."

Stomachs of these birds I have examined, contained chiefly portions of various insects, those being shot near the coast also containing a little sand mixed with a few blades of grass. I have never known it to eat fruit or grain. Pastoralists, sugar-planters, farmers, and orchardists, to whom this bird renders such valuable services, should therefore assist in affording it absolute protection by preventing thoughtless boys and pot-hunters from trespassing on their lands in search of "something to kill," not only in the close season but all the year round. The ever trustful and fearless disposition of this bird should in itself be a sufficient claim to the protection it undoubtedly deserves; but unfortunately the easy manner in which it may be approached is too often the cause of many of them falling victims to misplaced confidence in man. It is an extremely sociable species, frequenting the vicinity of houses, and breeding in trees close to the streets in many of the outlying Sydney suburbs. As I now write there is one culling in a fig-tree in the Museum grounds. On the outskirts of Ashfield, during the autumn months, I have observed just about dusk large flocks of these birds leave the well timbered paddocks, where they had been feeding all day, and take up their quarters for the night in some lofty gum trees in the most thickly populated part of this suburb.

Although the flight of this species is apparently slow and laboured, it is remarkably active, and an expert dodger when on the wing. While accompanied by Mr. E. H. Lane and Mr. George Savidge, at Roseville, near Middle Harbour, we heard shrill cries of distress uttered by some bird, and on looking round observed a Magpie-Lark and a White-fronted Falcon (*Falco lucidus*), tumbling over and over one another in the air. This was kept up for ten seconds or more, the Magpie-Lark at last successfully eluding the grasp and further pursuit of its fleet-winged and active enemy. I have also frequently seen it exhibit remarkable powers while on the wing, pursuing generally a zig-zag course, more especially when mobbed by a flock of smaller birds.

The nest is a round bowl-shaped structure, and is formed of pellets of mud mixed with bits of grass or rootlets, the inside being lined with dried grasses and occasionally with feathers. An average nest measures externally five inches and a half in diameter by four inches in depth; the inner cup measuring four inches and a quarter in diameter by two inches and a quarter in depth. It is usually placed on a bare horizontal branch, but not infrequently a site is selected where a few upright leafy twigs are growing out which slightly shelters the structure, although no attempt at concealment is made. It is a conspicuous object and at all times easy to discover, for it is generally placed towards the extremity of a limb, or some distance away from the trunk of the tree. A favourite situation is a smooth-barked gum tree on a river bank, but it may be also found in trees in open forest country, some distance from water. It is built at various heights, generally it is from twenty to sixty feet, but in stunted timber it is much lower, and I have found it in a *Melaleuca* within ten feet from the ground. The nest of this species resembles that of *Struthidea cinerea*, but when closely examined may be generally distinguished by its greater average depth, straighter walls, and thicker rim. Nests are frequently built close to the one occupied the previous season, and often inside of the old one. I once saw four nests built one on the top of the other, resembling so many basins placed one in the other, only about two inches of the top portion of the three upper nests being visible. At Ashfield I saw a nest of this species, resorted to by presumably the same pair of birds for three successive seasons. It is remarkable that the Black and White Fantail (*Sauroprocta melaleuca*) frequently constructs its nest in the same tree as one containing a nest of *Grallina picata*.

The eggs are usually four in number for a sitting, sometimes five, and vary considerably in shape, size, colour, and disposition of markings. The most common type found is oval in form, tapering somewhat sharply at the smaller end, and of a reddish-white ground colour, spotted and blotched with purplish-red and underlying markings of slaty-grey, in some instances forming a zone or cap on the larger end, in others being equally distributed over the shell. Some eggs are of a rich reddish-buff ground colour, which is almost hidden on the larger end with numerous confluent blotches of reddish-brown and clouded underlying patches of violet-grey. Others are oval in form and pure white, with a few small rounded purplish-black dots evenly distributed over the shell, and I have seen two sets pure white and entirely devoid of markings. Among a great number of eggs of this species now before me, it is noticeable that those obtained in the very hot inland districts of New South Wales are smaller, less rich in colour, and more sparingly marked than others taken in the cooler parts of the State, near the coast. A set of three measures:—Length (A) 1.25×0.87 inches; (B) 1.22×0.85 inches; (C) 1.21×0.85 inches. A set of four measures:—(A) 1.11×0.8 inches; (B) 1.05×0.8 inches; (C) 1.1×0.83 inches; (D) 1.12×0.82 inches. A remarkably handsome set of five eggs in the Australian Museum collection, taken by Mr. G. Savidge at Copmanhurst, on the 8th October, 1901, measures as follows:—Length (A) 1.12×0.85 inches; (B) 1.15×0.85 inches; (C) 1.1×0.82 inches; (D) 1.12×0.83 inches; (E) 1.07×0.82 inches.

Fledgelings are similar to the adults but duller in colour, having dusky-brown instead of bluish-black feathers on the upper parts and throat. Young birds have the tail feathers largely tipped with white, and the outermost feather on either side entirely white except a small portion of the outer web, and a subterminal streak on the margin of the inner web, which is brownish-black.

Mr. G. A. Keartland writes to me as follows:—"That *Grallina picata* is a most persistent breeder was proved by Mr. J. Gabriel and myself during October and November, 1895. Whilst collecting at Werribee, Victoria, on 14th October, we found a nest containing four fresh eggs, which I took. A fortnight later we revisited the tree to see if the birds had laid again in the old nest, but to our surprise found a fresh nest built within four feet of the old one and containing four eggs; these were taken by Mr. Gabriel. Again, a fortnight later, Mr. Chas. French, Junr., accompanied me to the tree to look for an article lost on the previous visit. We found another nest, containing four eggs, on the same branch as the former ones; Mr. French took the eggs. Again, a fortnight later, I revisited the spot and found another nest containing four eggs, which were left to hatch. As on the first visit I noticed a broken primary in the wing of the female, I was careful to see that it was the same bird each time we paid our fortnightly visit."

Nidification, in which both sexes take part, generally commences in August, and the usual breeding season in Eastern Australia continues the five following months. I have, however, taken eggs as early as the 3rd August, and have seen these birds building on the banks of the Namoi River at the latter end of November. In the Upper Clarence District, Mr. G. Savidge informs me that he once observed young birds being fed in the nest in July. A new nest is almost invariably constructed for each brood, of which two, if not three, are reared during the season. The deserted tenements of the Magpie-Lark are often taken possession of by other birds, and more frequently by the White-rumped Wood Swallow (*Artamus leucogaster*), the Ground Cuckoo-shrike (*Pteropodocys phasianella*), and the Black-faced Cuckoo-shrike (*Graucalus melanops*). On Yandembah Station, the late Mr. K. H. Bennett found a Black and White Fantail (*Sandoprocta melaleuca*) sitting on three eggs in a deserted nest of this species, the bottom of the nest having been relined with wool and fur.

There is a beautiful albino, and a semi-albino of this species in the Australian Museum collection.

The figure represents an adult male.

Genus **COLLYRIOCINCLA**. *Vigors & Horsfield.***Collyriocincla harmonica.**

GREY SHRIKE-THRUSH.

Turdus harmonicus, Lath., Ind. Orn., Suppl., p. xli., (1801).

Colluricincla harmonica, Gould, Bds. Austr., fol., Vol. II., pl. 74 (1848), *id.*, Handbk. Bds. Austr., Vol. I., p. 220 (1865).

Collyriocincla harmonica, Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 290 (1877).

ADULT MALE—*General colour above grey; hind neck, scapulars, and back amber-brown; upper wing-coverts grey, the lesser and median series washed with amber-brown; primaries and secondaries blackish-brown, eternally edged with grey, which increases in extent towards the outermost secondaries; tail grey; lores and chin dull white; under surface of the body light ashy-grey; centre of the abdomen and under tail-coverts dull white; bill blackish-brown; legs and feet greenish-grey; iris dark brown. Total length in the flesh 9.5 inches, wing 5.2, tail 4.1, bill 0.82, tarsus 1.3.*

ADULT FEMALE—*Distinguished from the male by having a very much paler bill, and the feathers of the throat, fore-neck, and breast having narrow black shaft-lines.*

Distribution.—Queensland, New South Wales, Victoria, South Australia.

THE Grey Shrike-Thrush is a common and generally distributed species throughout most parts of Eastern and South-eastern Australia. There are specimens in the Australian Museum collection obtained by the late Mr. W. S. Day at Cairns, Queensland, but it is more freely dispersed in the southern portion of that State. It is common in New South Wales,



GREY SHRIKE-THRUSH.

Victoria, and some parts of South Australia. I saw an example in the Botanic Gardens at Adelaide, and Dr. A. M. Morgan has recorded it from Laura, about one hundred and forty miles north of that city; Dr. A. Cheney has also found it breeding to the north-west of Port Augusta.

It frequents the coastal scrubs, open forest lands, mountain ranges, and the wooded margins of rivers and creeks. Partially cleared lands, and the neighbourhood of orchards, are also favourite resorts of this familiar and well-known bird. Usually it is met with singly or in pairs, except during the breeding season when accompanied with its

young. It is of a tame and fearless disposition, and when disturbed seldom flies far, alighting generally in the nearest tree, or on some fallen log, over which it proceeds in a series of hops. Although a resident species in New South Wales, it is more abundantly distributed during the spring and summer months. Near Sydney, during April, May, and the greater part of June, it utters a shrill note, quite different from the melodious notes poured forth in the breeding season. In June, 1893, at Toongabbie, near Parramatta, so much was I deceived by the notes and actions of a pair of these birds in the top of a lofty eucalyptus, that I had to shoot them in order to be sure of their identification. In the warm and sunny days that herald the approach of a coming spring, its notes are the richest and most melodious of any heard in the neighbourhood of large towns and cities, fully justifying the original vernacular name of Harmonic Thrush, bestowed on it by Dr. Latham. It is, however, more generally known as the Grey Shrike-Thrush, a name first applied to it by Messrs. Jardine and Selby in their "Illustrations of Ornithology."

The food of this species consists chiefly of various kinds of insects and their larvae, also worms, snails, centipedes, and small lizards. Writing from Eden, Twofold Bay, in August, 1901, Mr. J. A. Boyd informs me that one of these birds sits and whistles on his back verandah until he goes out and gives it some scrap of food from the safe; a bit of cheese being a great dainty. It is so tame that it will almost eat out of his hand.

The nest is a round bowl-shaped structure, outwardly formed of strips of bark and lined inside with fibrous roots, and varies considerably in size according to the position in which it is built. Some I have seen consisted principally of a root-lined cavity, just sufficient to accommodate the bird while sitting; others, built in the thin forked branches of trees, had the outer walls very thick, and the rim neatly rounded. One I found at Newington, built in a *Melaleuca*, had a strip of blue serge two inches wide and twenty inches long, utilised in its outer construction, the material being thoroughly interwoven in the nest and securely bound around two of the branches. When built in hollow limbs, the same site is frequently resorted to year after year, but usually a new nest is formed on the top of the old one. An average nest measures five inches and a half in external diameter by four inches and a half in depth; internally three inches and three quarters in diameter by two inches and a half in depth. The site for the nest is a varied one. Preference, however, is given for the hollows in the tops of stumps, burnt out cavities in limbs, or the thick fork of a tree. It is also built in thin pronged upright branches: between the top a piece of loose bark and the trunk of a tree, and in the cleft of a bank or rock. The different species of *Eucalyptus* and *Melaleuca* are the trees usually selected as nesting sites, also the Turpentine (*Syncaesia laurifolia*), and the nests are built at heights varying from two to forty feet from the ground. Generally they are found within hand's reach, or not at an higher altitude than twelve feet. Curious nesting-sites are sometimes selected by this species. For five years consecutively a pair built in an old iron pot standing on a shelf in a carpenter's shop at Cullenbone; and Dr. A. M. Morgan found a nest with three fresh eggs at Port Augusta, South Australia, on the 14th August, 1900, built on the top of an old nest of *Pomatorhinus superciliosus*. At Strathfield, near Sydney, a nest was constructed against a creeper-covered wall of a house.

The eggs, usually three, sometimes only two, and rarely four in number for a sitting, are subject to considerable variation in shape, size, and disposition of markings. They vary from oval to thick and elongate oval in form, the shell being close-grained, and its surface lustrous, and in ground colour from pearly to buffy-white, which is usually evenly marked with freckles, spots, and blotches of olive-brown, brownish-black, and underlying markings of slaty or deep bluish-grey. Others have a zone or cap only on the larger end formed of large confluent spots and blotches, while a not uncommon variety is finely freckled over the entire surface of the shell. Some have the ground colour on the larger end almost obscured with coalesced black and slaty-black markings. A set of three, taken at Canterbury, near Sydney, on the 17th September, 1897, measures as follows:—Length (A) 1.21 × 0.87 inches; (B) 1.2 × 0.86 inches; (C) 1.2 × 0.85 inches. Another set, taken in the same locality, on the 20th September, 1897, measures:—(D) 1.3 × 0.9 inches; (E) 1.31 × 0.88 inches; (F) 1.29 × 0.9 inches.

Fledgelings have the upper parts greyish-brown; the back, scapulars, upper wing-coverts, and secondaries distinctly tinged with olive; upper wing-coverts externally edged with rufous; feathers around the eye and a superciliary stripe pale rufous; throat, fore-neck, and chest dull greyish-white, passing into pure white on the breast and abdomen, all the feathers having a broad dusky-brown streak down the centre. Wing 4 inches.

Dr. W. Macgillivray writes to me as follows:—"Collyriocincla harmonica frequently resorts to the same cleft year after year to nest. I have known a brood to be reared for five consecutive

* Cox and Ham.—Proc. Linn. Soc. N.S.W., 2nd ser., Vol. iv., p. 406 (1889).

years in the same place in the bank of a small creek in the Western District of Victoria." From Port Augusta, South Australia, Dr. A. Chenery writes me:—"C. *harmonica*, is common both in the gum creeks of Flinder's Range, and on the myall plains and mulga flats of the north-west. I have taken a nest in the broken stump of a black oak on the steep side of a table-land, and also in small shrubs in the gum creeks of the Flinder's Range."

Nidification usually begins about the first week in August, and the nest is completed in about ten days. The eggs are deposited on successive days, and full sets of fresh eggs are not uncommon in the last week in August. The earliest record I have of nidification is the 25th July, 1896, and of a full set of fresh eggs on 7th August, 1897. During the past fifteen years, near Sydney, I have found more nests with eggs in September, than any other month. Fresh eggs for a second brood may be looked for in November, and I have known them to be taken as late as the middle of December.

This species is one of the foster-parents of the Pallid Cuckoo (*Cuculus pallidus*). On the 25th October, 1893, I exhibited at a meeting of the Linnean Society of New South Wales, a set consisting of three eggs of *Collyriocinclla harmonica* and an egg of *Cuculus pallidus*, taken from a nest near Woolli Creek. The Cuckoo's egg was deposited on the 17th October, when the nest contained but two eggs of the Shrike-Thrush.

Collyriocinclla rectirostris.

STRAIGHT BILLED SHRIKE THRUSH

Collyriocinclla rectirostris, Jard. and Selby, Ill. Orn., Vol. IV., pl. XXXI., (1839).

Collyriocinclla selbii, Gould, Bds. Austr., fol., Vol. II., pl. 77 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 224 (1865).

Collyriocinclla rectirostris, Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 291 (1877)

ADULT MALE—*Head, rump, and upper tail-coverts grey; back, scapulars, lesser and medium upper wing-coverts under-brown; primaries, secondaries, and greater wing-coverts dark brown, externally washed with grey, the inner series of the secondaries and the greater wing-coverts under-brown; tail grey; lores and an indistinct line over the eye dull white; chin, throat, and fore-neck dull white, passing into greyish white on the remainder of the under surface; sides of the breast, flanks, and under tail-coverts grey; bill black; legs and feet greenish-grey; iris dark brown. Total length 9.5 inches, wing 5.1, tail 4.2, bill 1.1, tarsus 1.3.*

ADULT FEMALE—*Distinguished from the male by its rufous eye-brow and blackish shaft lines to the feathers of the under surface.*

Distribution.—Tasmania and some of the islands of Bass Strait.

THIS species is represented in the Australian Museum collection by several specimens procured by Mr. George Masters near the Ouse River, and other parts of the State. In a northerly direction, its range over the islands of Bass Strait was extended nearer to the Australian continent by members of the Field Naturalists' Club of Victoria, who procured specimens on King Island in November, 1887.

Mr. E. D. Atkinson sends me the following note from Table Cape, Tasmania:—"I have met with *Collyriocinclla rectirostris* in most parts of Tasmania, also in the larger islands of Bass Strait. It chiefly frequents cleared lands, and is seldom seen any distance in the forest. It is an active and sprightly bird, and possesses a very musical note."

From notes made by Dr. L. Holden, principally at Circular Head, Tasmania, I have extracted the following information:—"Collyriocinclla rectirostris is an exceedingly courageous bird, the male being larger and more noisy. He snaps his bill before uttering his resounding

cies. I took it for the hammering of a tree, like the noise made by a Woodpecker, but after repeated careful and close inspection with a field-glass, I discovered he made the noise with his bill. He is known by the local names of 'Whistling Dick,' and 'Duke Willie,' on account of his peculiar note. Sitting one day by the Russell Falls River, near Hobart, in a gum-tree forest, my companion and I were engaged in boiling the mid-day billy, when one of these birds flew on to a branch near by and began to call. My bush friend threw a piece of bread towards him, when down came the bird, searched for and found the bread, and carried it off high up into the trees. My friend seemed to think it quite an ordinary performance, and told me that this species was often very familiar in these solitudes. On the 14th November, 1886, at Circular Head, I found a nest of *C. rufirostris*, built in the fork of a tea-tree about eight feet from the ground. It was a deep cup-shaped structure, composed chiefly of strips of bark, and thinly lined with dried grass and a little horse-hair. The female was sitting on three fresh eggs. She would not leave the spot, even when the nest was destroyed. I found another in the top of a tea-tree, built in an old opossum's nest, containing a young bird, which fluttered to the ground and escaped. During October, 1887, I found three more nests, built in tea-trees, at heights varying from seven to fifteen feet from the ground, each nest containing two eggs. On the 25th September, 1890, I found a nest built in a bush barely four feet from the ground, with three fresh eggs. Also another, on the 23rd November following, constructed in the top of a dead tree in scrub, containing three hard set eggs. No bird sits closer to its eggs than the female of this species. The eggs, which vary very much in shape, size, and markings, are more frequently three than two in number for a sitting."

In several sets of these eggs now before me, rounded oval is the predominate form, others are somewhat sharply pointed at each end; elongate-oval, the commonest type of *C. harmonica*, is poorly represented, while one set is almost globular. In ground colour they vary from pearly-white to dull brownish-white, which is freckled, spotted, or blotched with olive-brown, blackish-brown, or chestnut-brown, and underlying markings varying from faint to dark slaty-grey. One type, in shape, colour, and disposition of markings, closely resembles the eggs of the Olivaceous Thickhead. The markings are uniformly distributed in some specimens, in others they predominate on the larger end, where they form a cap or zone. In one set the markings are confined entirely to the thicker end, and consist of large olive-brown blotches intermingled with small slaty-grey underlying spots, which far exceed in number and extent the surface blotches. A set of two, taken by Dr. L. Holden, at Circular Head, Tasmania, on the 5th October, 1891, measures:—Length (A) 1.06×0.85 inches; (B) 1.08×0.87 inches. A set of three, taken at Table Cape, on the north-west coast of Tasmania, by Mr. E. D. Atkinson, in November, 1880, measures:—Length (A) 1.23×0.86 inches; (B) 1.25×0.9 inches; (C) 1.2×0.85 inches.

Young males have the feathers of the under surface more broadly streaked than the adult female, and have the sides of the head and the upper wing-coverts washed with rufous.

From the nests found by Dr. Holden, September and the three following months appear to constitute the usual breeding season of this species.

Collyriocincla brunnea.

BROWN SHRIKE-THRUSH.

Collyriocincla brunnea, Gould, Proc. Zool. Soc., 1840, p. 164; *id.*, Bds. Austr., fol., Vol. II., pl. 76 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 223 (1865).

ADULT MALE.—General colour above pale brown; primaries, secondaries, and upper wing-coverts brown, externally edged with ashy-grey; tail feathers brown, narrowly edged with ashy-grey; lores and the anterior portion of the cheeks dull white; ear-coverts pale brown; chin and throat dull white.

passing into pale ashy-brown on the breast, and dull white tinged with fawn colour on the abdomen; thighs ashy-brown; under tail-coverts dull white; under wing-coverts greyish-brown; bill black; legs and feet blackish-brown; iris brown" (Morton). Total length 10·3 inches, wing 4·95, tail 4·3, bill 0·8, tarsus 1·2.

ADULT FEMALE—Distinguished from the male by its dull rufous eye-brow; the under surface and under tail-coverts being more distinctly tinged with fawn colour, and the feathers of the fore-neck and breast having dark brown shaft streaks; under wing-coverts pale orange-buff; bill light yellowish-horn colour, fleshy-brown at the base.

Distribution.—North-western Australia. Northern Territory of South Australia.

GOULD described the type of this species from North-western Australia, and states in his "Handbook to the Birds of Australia" that "it is abundantly dispersed over the Cobourg Peninsula, and is to be met with in all the forests in the immediate neighbourhood of Port Essington and the north coast generally." The late Mr. E. Spalding found it very common in the vicinity of Port Darwin in 1877; and Mr. Alexander Morton, while collecting on behalf of the Trustees of the Australian Museum, obtained examples of both sexes at Port Essington, in February and March, 1870, from which the above descriptions are taken. Mr. E. J. Cairn procured an adult male and female near Derby, North-western Australia, in 1886; and in the same neighbourhood Mr. G. A. Kearnland found them breeding in 1890, and procured an adult male. It is worthy of note that specimens from Derby are much paler than examples from Port Essington. In 1898, Mr. L. Olive also found them breeding near the Katherine River, in the Northern Territory of South Australia. All the adult males I have seen from Northern and North-western Australia, agree with Gould's description and figure of this species, and have no white eyebrow.

Dr. Sharpe[†] and Count Salvadori[‡] agree in describing the adult of *C. brunnea*, respectively from Cape York and New Guinea, as having a distinct white eyebrow, like *C. superciliosa*, Masters, and which both authors include as a synonym of *C. brunnea*. No reference is made to the different plumage of the adult female, of which we have abundant proof in the specimens obtained at Port Essington. Gould figures the two sexes of *C. brunnea* in his "Birds of Australia," but omits to give a description of the female.

I have never seen a typical specimen of *C. brunnea* from Northern and Eastern Queensland. *C. superciliosa*, Masters, was obtained at Cape Grenville, one hundred miles south from Cape York, and has a distinct white eyebrow similar to examples described from Cape York and New Guinea. Instead of *C. superciliosa*, Masters, being relegated as a synonym of *C. brunnea*, it is evident that the species inhabiting the Cape York Peninsula and New Guinea must bear the name of *Collyriocincla superciliosa*. I have compared Mr. Masters' type of the latter species with examples from New Guinea, and find them alike, except that the white eyebrow is broader and more distinct in the Australian bird, which I take to be a very old male.

Mr. G. A. Kearnland writes me:—"During the journey of the Calvert Exploring Expedition in North-western Australia, Brown Shrike-Thrushes were seen on the southern margin of the Great Desert, and again near the junction of the Fitzroy and Margaret Rivers. They were very tame, and allowed me to walk under a *Bauhinia* tree, about twenty feet high, while they hopped about the upper branches, my attention being frequently attracted to them by their loud and musical notes. When the young brood leave the nest, the parents will perform all manner of antics to divert the attention of an intruder. A pair which reared their family near our camp on

* Handbk. Bds. Austr., Vol. i., p. 223 (1895).

† Cat. Bds. Brit. Mus., Vol. iii., p. 291 (1877).

‡ Orn. Pap. et Molucc., Pt. ii., p. 209 (1881).

the Fitzroy River, kept fluttering over the back of my dog for some minutes whilst I was endeavouring to find the nest. Three young ones, just able to fly, were soon disturbed, and as they went from bush to bush, with the dog chasing them, the parents closely followed, snapping their bills and feigning a broken leg or wing."

The nest of this species is similarly constructed to that of other members of the genus, being outwardly composed of strips of bark, fine pliant twigs, and dried grasses, and lined inside with rootlets. It is usually built in the top of a hollow stump or fork of a tree. Eggs three in number for a sitting, varying in shape from an elongate to thick oval, and of a pearly-white ground colour, dotted, spotted, and blotched with olive, rich umber, or blackish-brown, and superimposed spots of dull bluish or blackish-grey, the markings predominating on the larger end, and assuming the form of a zone, in others being uniformly distributed over the surface of the shell. An average specimen of the former type, from a set of two, taken by the late Mr. T. H. Bowyer-Bower, at Derby, North-western Australia, in October, 1886, measures: Length 1.18×0.77 inches. Specimens of the latter type in the Macleay Museum collection, obtained by the late Mr. Edward Spalding, near Port Darwin, in the Northern Territory of South Australia, measure: (A) 1.2×0.8 inches; (B) 1.18×0.78 inches. An egg of this species, taken on the 18th October, 1898, by Mr. E. Olive near the Katherine River, and kindly lent by Dr. Charles Ryan, of Melbourne, is in form a thick oval, slightly compressed at the smaller end, and of a glossy-white ground colour; uniformly marked, except on the top of the larger end, with dots, spots, and small blotches of olive-brown, intermingled with similar underlying markings of dull blackish-grey. Length: 1.00×0.81 inches. This specimen is represented on Plate B. IV., Figure 15.

Young birds have the sides of the head and all the under surface deeply tinged with fawn colour; the primaries, secondaries, and upper wing-coverts externally edged with rufous; the under wing-coverts a deep orange-buff; and the breast more broadly streaked with dark brown than in the adult female.

Like many other species inhabiting hot and arid districts, the breeding season of the Brown Shrike-Thrush is probably influenced by an abundant rainfall. At Derby, North-western Australia, the late Mr. T. H. Bowyer-Bower obtained fresh eggs in October; while near the same locality, Mr. G. A. Kearnland observed fledgelings at the end of March. In North Australia, Gilbert found a nest with eggs in February; and, as previously pointed out, Mr. E. Olive took the eggs of this species near the Katherine River in October, 1898.

Collyriocincla pallidirostris, described by Dr. Sharpe from specimens obtained at Port Essington and the Nicholson River, is, I believe, the female or young male of this species.

Collyriocincla parvula.

LITTLE SHRIKE-THRUSH.

Collariocincla parvula, Gould, Proc. Zool. Soc., 1845, p. 62; *id.*, Bds. Austr., fol., Vol. II., pl. 78 (1848), *id.*, Handbk. Bds. Austr., Vol. I., p. 225 (1865).

Pinarolestes parvulus, Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 296 (1877).

ADULT MALE—*General colour above olive-brown; upper wing-coverts like the back, the greater series with fulvous tips; primaries and secondaries olive-brown on their outer webs, brown on their inner webs, except the innermost secondaries, which are of a uniform olive-brown; apical half of the primaries externally edged with ashy-brown; tail dull olive-brown; lores and a superciliary stripe dull white; chin and throat dull white, passing into pale fulvous on the remainder of the under surface and the under tail-coverts, the feathers of the fore-neck having narrow brown shaft-streaks;*

* Cat. Bds. Brit. Mus., Vol. iii., p. 293 (1877).

bill blackish-brown; legs and feet bluish-grey. Total length 7·7 inches, wing 4, tail 3·3, bill 0·8, tarsus 1·1.

ADULT FEMALE—*Similar in plumage to the male.*

Distribution. North-western Australia, Northern Territory of South Australia.

THE Little Shrike-Thrush inhabits the north-western and northern portions of the continent. There are specimens in the Macleay Museum, collected at King Sound and Cambridge Gulf, North-western Australia, and at Port Darwin in the Northern Territory of South Australia. Mr. Alex. Morton also obtained specimens at Port Essington, in 1879, the farthest point east I have known it to be found, and where Gilbert procured the type.

In the "Ornithology of the Chevert," Mr. George Masters has, by a *lapsus calami*, recorded this species from Cape York, Cape Grenville, and Palm Island, instead of *C. rufigaster*, or its smaller northern ally *C. parvissima*. Dr. Ramsay[†] has also recorded *C. rufigaster* from Derby, North-western Australia, instead of the present species.

In his "Handbook," Gould remarks: "This species is a native of Port Essington and the neighbouring parts of the northern coast of Australia." Gilbert, to whose notes I must refer for all that is known about it, states that it is "an inhabitant of the thickets, is an extremely shy bird, and is generally seen on or near the ground. Its note is a fine Thrush-like tone, very clear, loud, and melodious. The stomach is muscular, and the food consists of insects of various kinds, but principally coleoptera. The nest and eggs were brought me by a native; they were taken from the hollow part of a tree, about four feet from the ground. The nest, which was too much injured to be preserved, was formed of small twigs and narrow strips of bark of a *Malaleuca*. The eggs were two in number, of a beautiful pearly flesh-white, regularly spotted all over with dull reddish and umber-brown; like the eggs of the other species of the genus, they are also sprinkled over with bluish markings, which appear as if beneath the surface of the shell; their medium length is one inch, and breadth nine lines."

Two eggs of a set, taken near Port Darwin, are oval in form, pearly white, sparingly freckled and spotted with rich umber-brown, except on the larger end, where intermingled with a few underlying spots of pale bluish-grey, the markings are larger and confluent, forming a well defined zone. Length: (A) 1 × 0·72 inches; (B) 0·98 × 0·73 inches. Another set of two, taken in the same locality, measures: (A) 0·95 × 0·75 inches; (B) 0·94 × 0·75 inches. In shape, size, colour, and disposition of markings, the eggs of this species cannot be distinguished from those of *Collyriocincla rufigaster*. There are specimens in the Macleay Museum, taken at Derby, North-western Australia, in 1886.

Collyriocincla rufiventris.

BUFF-BELLIED SHRIKE-THRUSH.

Collyriocincla rufiventris, Gould, Proc. Zool. Soc., 1849, p. 164; *id.*, Bds. Austr., fol., Vol. II., pl. 75 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 222 (1865).

Collyriocincla rufiventris, Sharpe, Cat. Bds. Brit. Mus., Vol. III., p. 292 (1877).

ADULT MALE—*General colour above dark grey, slightly tinged with olive; primaries, secondaries, and upper wing-coverts brown, externally edged with grey; tail feathers brown, washed with grey on their outer webs; lores dull white; chin and throat greyish-white, passing into ashy-grey on the chest; remainder of the under surface pale fawn colour, becoming of a deeper tint on the under tail-coverts; bill blackish-brown; legs and feet greenish-grey; iris brown. Total length 8·75 inches, wing 4·8, tail 4, bill 0·9, tarsus 1·2.*

* Proc. Linn. Soc. N.S.W., Vol. i., p. 50 (1877).

† Proc. Linn. Soc. N.S.W., 2nd ser., Vol. ii., p. 167 (1888).

ADULT FEMALE—*Distinguished from the male by the blackish shaft lines and darker grey feathers of the under surface.*

Distribution.—North-western and Western Australia, South Australia, Central Australia.

THE Buff-bellied Shrike-Thrush is the representative of *Collyriocincla harmonica* in the western portion of the continent. There are specimens in the Australian Museum collection, obtained by Mr. George Masters at Port Lincoln, South Australia, in September, 1865, and at King George's Sound, Western Australia, in February and April of the following year. In August, 1901, Mr. Edwin Ashby met with this species at Callion, about eighty-five miles north of Coolgardie, and three hundred and sixty miles from the coast.

During the journey of the Horn Scientific Expedition in Central Australia, these birds were frequently met with, and regarding them Mr. G. A. Kearnland writes to me as follows:—“The Buff-bellied Shrike-Thrush is found near most of the permanent water-holes and wells in Central Australia, and, as you will see by the collection sent you, we obtained specimens first at Reedy Hole, and later on at the Levi Range. In many respects it bears a close resemblance to its near ally *C. harmonica*, and especially in its clear and musical notes. It chiefly frequents shady gullies and the dense undergrowth of the forest, hopping nimbly over the ground or along the stout limbs of eucalypts in search of insects, on which it feeds. All the nests found were built in hollow stumps or between forked branches.”

From Point Cloates, North-western Australia, Mr. Tom Carter writes me, as follows:—“*Collyriocincla rufiventris* is common here in the deep gorges of the ranges. On the 27th July, 1899, I shot recently fledged young, and saw an adult bird hopping about with a fat lizard in its bill, and singing lustily while so engaged.”

Mr. C. Ernest Cowle, of Ilamurta, Central Australia, found a nest of this species on the 17th November, 1899, containing three heavily incubated eggs. The nest, which I have now before me, is an open cup-shaped structure, formed chiefly of strips of dried bark, intermixed with a few wiry rootlets and grasses, and was built in the fork of a tree, a few feet from the ground. It measures externally five inches in diameter by three and a half inches in depth; the inner cup measuring three inches and a half in diameter by two inches and three-quarters in depth. Eggs two or three in number for a sitting, varying from elongate to rounded oval in form; white; some being finely spotted, others boldly blotched, particularly at the larger end, with different shades of olive or reddish-brown, and underlying markings of dull bluish-grey. Length:—(A) 1.2 × 0.85 inches; (B) 1.21 × 0.85 inches. A set of two, taken at Ilamurta, Central Australia, measures:—(C) 1.14 × 0.82 inches; (D) 1.12 × 0.83 inches. Two eggs, taken by Mr. C. E. Cowle, in April, 1900, at Ilamurta, are very much smaller than typical examples, and vary much in size. They are oval in form, the shell being close-grained, smooth, and slightly glossy. The ground colour is pearly-white, which is heavily blotched and spotted uniformly over the shell with olive-brown and pale inky-grey, some of the latter markings appearing as it beneath the surface of the shell. Length:—(A) 1.05 × 0.8 inches; (B) 1 × 0.73 inches.

Young birds have a distinct rufous eyebrow; sides of the head, neck, and all the under surface fawn colour; the feathers on the throat and fore-neck broadly streaked with blackish-grey; the primaries and their coverts, secondaries, and greater wing-coverts brown, washed with rufous; bill blackish-brown; base of the lower mandible fleshy-brown.

Mr. Cowle informs me this species usually breeds in March or April; or in September and the two following months, if there is a heavy rainfall. The above described nest, however, was taken during a prolonged drought. In Western Australia, Gould records that it breeds in the latter part of September and the beginning of October, and that on two occasions Gillett had found the eggs of this bird in old nests of *Pomatorhinus superciliosus*.

Collyriocincla rufigaster.

RUFOUS-BREASTED SHRIKE-THRUSH.

Colluricincla rufigaster, Gould, Proc. Zool. Soc., 1845, p. 80.*Colluricincla rufigaster*, Gould, Handbk. Bds. Austr., Vol. I., p. 226 (1865).*Colluricincla parvissima*, Gould, Ann. & Mag. Nat. Hist., Ser. 4, Vol. X., p. 114 (1872).*Collyriocincla coccineiventris*, North, Rec. Austr. Mus., Vol. II., p. 49 (1892).

ADULT MALE. *General colour above dull olive brown, slightly shaded with grey, the upper tail-coverts more distinctly tinged with olive; lesser and mediana upper wing-coverts like the back; the greater coverts and inner secondaries brown, washed with olive; primaries and outer secondaries brown on their inner webs, olive brown on their outer webs; tail-feathers brown, slightly tinged with olive; feathers in front of the eye dull white, chin and throat pale buffy white; remainder of the under surface fawn colour, richer on the abdomen and under tail-coverts, the fore-neck indistinctly streaked with dull olive brown; bill and legs fleshy brown; iris dark brown. Total length 2.4 inches, wing 1.85, tail 1.1, bill 0.8, tarsus 1.05.*

ADULT FEMALE.—*Similar in plumage to the male.*

Distribution.—Eastern Queensland, North-eastern New South Wales.

REGARDING *Collyriocincla parvissima* and *C. coccineiventris* only as climatic forms or races of *C. rufigaster*, which vary in size and colour according to their distribution and environment, it will be seen from the above synonymy that I have united them with the present species. Knowing that many will differ from this view at the present time, when every slight variation from the common type, as a rule, receives specific or subspecific recognition, I have pointed out the difference in these races, and kept the remarks on each separate from those on the typical species, *C. rufigaster*.

The range of *Collyriocincla rufigaster*, Gould, extends throughout the greater portion of the coastal brush of Eastern Queensland and North-eastern New South Wales. Mr. George Masters met with it at Wide Bay; and Mr. J. A. Thorpe informs me that he found it common in the Richmond River District. Mr. R. Grant has also procured specimens in the Bellinger River District, the southern limit of its known range. It is fairly plentiful in the scrubs at the head of the Clarence River, where I observed it in November, 1898. At that time it was usually met with in pairs, each keeping to a separate part of the creek or scrub in which their nest was built.

The note of this species is very different from the rich and melodious notes of the Harmonious or Grey Shrike-Thrush, also heard in the same locality, consisting of a clear whistle, repeated three times, and again immediately uttered in a different key. Like *C. harmonica*, and other members of this genus, its food consists principally of various kinds of insects and their larvæ.

Mr. George Savidge writes:—“*Collyriocincla rufigaster* is a resident species in the Upper Clarence District, and may be observed in about the same numbers all the year round. Its call in winter is different from the note uttered in spring, but I have never known it to possess any ventriloquial powers, or imitate the notes of any other species. It is, as you know, not uncommon in the scrub close to my house, but I have never seen it in open forest lands. These birds commence to build in September, and both sexes assist in the task of nidification, but I cannot say if the duty of incubation is also shared.”

The nest is a deep cup-shaped structure, outwardly formed of a thick layer of dead and green leaves, bound round and held together with long pliant stems of climbing plants, intermingled with a small quantity of cobweb and the silky-green outer covering of spiders' cocoons; internally it is neatly lined with thin pliant stems and wiry rootlets. Unlike the nest of

Collyriocincla harmonica, bark or bark-fibre is seldom used in its construction, and it resembles more a miniature nest of the Cat-bird (*Elurædus viridis*). An average nest measures externally five inches in diameter by four inches in depth; internal diameter three inches, depth two inches and a half. They are usually built in a thin three or more pronged upright branch of any thickly leaved shrub, or in a mass of vines in the scrubs, at a height varying from five to twelve feet from the ground. At Copmanhurst, I saw one in a Bean-tree (*Castanospermum australe*), and another in one of the introduced *Lantana* bushes which over-run so many of the scrubs on the northern rivers of New South Wales, and elsewhere.

The eggs are three in number for a sitting, varying from elongate to rounded oval in form, the shell being close-grained, smooth and lustrous. They are of a pearly-white ground colour, with dots, spots, and blotches of reddish-brown, distributed over the surface of the shell, and intermingled with underlying spots and blotches of warm slaty-grey. Some specimens have a



NEST OF RUFOUS-BREADED SHRIKE-THRUSH.

dull white ground colour, which is almost obscured with indistinct fleecy markings, intermingled with small irregular-shaped blotches of pale brown, and underlying markings of dull lilac-grey. Others have rich red dots and spots, and could easily be mistaken in character and colour of markings for lightly spotted varieties of *Grallina picata*. The markings are generally larger, and predominate on the thicker end of the shell. Length:—(A) 1.07 × 0.75 inches; (B) 1.05 × 0.78 inches. A set of three measures:—(A) 1.03 × 0.8 inches; (B) 1.03 × 0.79 inches; (C) 1.01 × 0.75 inches.

In the coastal brushes of New South Wales, the breed-

ing season of this species commences about the middle of September, and continues until the end of January.

The nest figured was taken by Mr. George Savidge in the Cangai Scrubs, Upper Clarence River District, in November, 1898, and contained two fresh eggs.

Although undoubtedly very closely allied to the present species, Gould's *Collyriocincla parvissima* is a decidedly smaller northern form, and can furthermore be distinguished by its upper parts being more strongly washed with olive. An adult male from Cape York measures as follows:—Total length 6.3 inches, wing 3.5, tail 2.7, bill 0.75. It ranges as far south as the neighbourhood of the Herbert River, Queensland.

Mr. J. A. Boyd, who sent me several nests and sets of eggs, while resident at the Herbert River, wrote as follows:—"Collyriocincla parvissima is not at all particular in its choice of a building place. I have taken its nest in a stunted *Dracena*, and from the upright fork of a *Mango*, twelve feet from the ground. In November, 1892, I found one built in some half-dozen reeds, not a foot from the ground: and I have pulled one out of the leaves of a *Pandanus*.

I also took one from a cluster of vines, eight feet from the ground; and another, about ten feet up, in a tree overhanging water."

Mr. Frank Hislop informs me that in the Bloomfield River District, the nests are sometimes built in lawyer-vines, or on a scrub *Pandanus*, and generally within three or four feet from the ground.

The nests sent by Mr. Boyd are round, open, cup-shaped structures, formed externally of thin strips of bark, green and dried leaves, long wiry tendrils intermixed with spider-webs and cocoons; the inside being thinly lined with wiry rootlets. Both externally and internally the leaves form the chief part of the structure. A very pretty nest is one formed principally of green leaves, moss, and the green silky covering of spider-cocoons, relieved only on the outside with snow-white egg-bags of spiders. It measures externally four inches and a half in diameter by three inches and three-quarters in depth; the inner cup three inches in diameter by two inches and three-quarters in depth. Eggs two or three in number for a sitting, varying from elongate to rounded oval in form, and from a pure pearly-white to a dull brownish-white ground colour, which is freckled, spotted, or heavily blotched with reddish-brown, amber-brown, or olive-brown, intermingled with similar underlying markings of dark slaty or dull bluish-grey. In some specimens the markings are evenly distributed over the surface of the shell, but as a rule they predominate on the larger end, where they become confluent and form a cap or irregular zone. Occasionally an egg in a set will be devoid of markings, with the exception of one or two large irregular-shaped amber or reddish brown patches. A set taken on the 17th October, 1894, measures: Length (A) 0.07×0.75 inches; (B) 0.05×0.75 inches. Another set of three, from the Bloomfield River District, measures: Length (A) 0.02×0.7 inches; (B) 0.0×0.7 inches; (C) 0.04×0.72 inches.

During many years' observation, Mr. J. A. Boyd found the first nest with eggs as early as the 14th September, and the latest in the season on the 25th January. In the latter instance, the eggs were heavily incubated.

Collyriocincla cerviniventris, separated by me, is an inland form of *C. rufigaster*, from which it may be distinguished by its longer and thinner bill, and by its very much paler upper and under surface. An adult male measures: Total length 7.2 inches, wing 3.7, tail 3.2, bill 0.87, depth at nostril 0.25, tarsus 1.02. The eggs of this form are, as a rule, indistinguishable from those of typical eggs of *C. rufigaster*. Two, however, taken by the late Mr. George Barnard, of the Dawson River, Queensland, and from whom the types of this race were obtained, approach nearer in the dark olive-brown tint of their markings to a common variety of the eggs of *C. harmonica*. They are, of course, much smaller than the eggs of the latter species, measuring only: Length (A) 1.03×0.74 inches; (B) 1.01×0.74 inches.

That the birds from the Dawson River are different from typical examples of *C. rufigaster* is borne out by the fact that when the late Mr. George Barnard sent specimens to Dr. Ramsay for identification, he determined them to be *C. parvula*, and recorded them as such from that district in his "Tabular List of Australian Birds."

Typical sized eggs of *Collyriocincla rufigaster* from the Clarence River, and of each race, *C. parvissima* from Cape York and the Herbert River, and *C. cerviniventris* from the Dawson River, will be found figured on Plate B, IV.

Family CAMPOPHAGIDÆ.

Genus GRAUCALUS, *Cuvier*.**Graucalus melanops.**

BLACK-FACED CUCKOO SHRIKE.

Corvus melanops, Lath., Ind. Orn., Suppl., p. xxiv., (1801).

Graucalus melanops, Gould, Bds. Austr., fol., Vol. II., pl. 55 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 192 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 30 (1879); Salvad., Orn. Pap. et Molluc., Pt. II., p. 130 (1881).

ADULT MALE—*General colour above grey: upper wing coverts grey: primaries black, externally edged and tipped with grey: secondaries black, the outermost feathers broadly margined with grey, the latter colour increasing in extent towards the innermost feather, which has the outer web and tip entirely grey: two central tail-feathers grey, blackish on their apical portion, and narrowly tipped with white: the remainder black, largely tipped with white: forehead, feathers above the eye, ear-coverts, sides of neck and throat black: chest dark grey, gradually becoming lighter on the breast, and pure white on the abdomen and under tail-coverts: bill black: legs and feet black: iris dark brown. Total length in the flesh 1·3 inches, wing 8, tail 5·8, bill 1, tarsus 1·05.*



BLACK-FACED CUCKOO-SHRIKE.

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—All parts of the Australian continent, islands of Torres Strait, New Guinea, Aru Islands, Ke Islands, Louisiade Archipelago, the Moluccas, Timor, New Zealand, Lord Howe Island.

ALTHOUGH the vernacular name of Cuckoo-shrike has been applied to the representatives of the family Campophagidæ inhabiting Africa, Madagascar, and India for several decades, and in recent years by Gould and Sharpe in their work on the "Birds of New Guinea," the present species is popularly known in nearly all parts of Australia, by the name of "Blue Jay."

Representatives of this widely distributed genus are found in Africa, Madagascar, India, Ceylon, the Malayan and Moluccan Archipelagos, New Guinea, Australia, and Tasmania. *Graucalus melanops* has a most extensive range. It is found in all parts of the Australian continent, the islands of Torres Straits, also in South-eastern New Guinea, the Aru Islands, Ke Islands, Louisiade Archipelago, the Moluccas, Timor, and occurs as an occasional visitant to New Zealand and Lord Howe Island. There is a variation in the measurement of adult specimens, even when procured in the same locality. The wing of an adult male from Derby, North-western Australia, measures 7·6 inches, of another from King George's Sound 8 inches. In a large number of Australian specimens before me, however, the extremes of size are exhibited in two fully adult males, procured on the Mehi River, near Moree, New South Wales, on the 3rd November, 1897. The wing of one shot by Mr. J. A. Thorpe, measures 8·3 inches; another, shot by myself, measures only 7·5 inches. The wing of an adult male, obtained by Mr. W. Nicholls on Lord Howe Island in October, 1892, measures 7·6 inches, and one from Amboina is exactly the same size.

In New South Wales, the present species is resident throughout the year, but is far more abundant during the spring and summer months. It gives preference for open forest lands near the coast, and the timbered margins of rivers and creeks are its chief resorts inland. It has a slow undulating flight; and when resting, which it usually does on a dead branch of a tree, frequently utters a peculiar low rattle-like note. Generally it is met with in isolated pairs during the breeding season, each pair keeping to its own domain; but during the late summer and autumn months the adults, accompanied by their young, associate together in flocks, and are a nuisance about orchards and vineyards owing to their depredations. This species has a curious habit, when settling after flight, of lifting the wings and refolding them again.

In the rocky heights of Mereenie Bluff and Stokes' Pass, Central Australia, Mr. G. A. Kearnland observed a number of these birds soaring high in the air, and performing graceful evolutions, and, later on, hopping about the rocks in a peculiar manner, which deceived him as to their identity. Two he shot proved to be male and female, and were in full adult plumage. During a trip in August, 1900, Dr. A. M. Morgan also observed flocks of these birds in two stages of plumage at Mount Gunson, about one hundred miles north-west of Port Augusta, South Australia.

The food of this species is obtained chiefly among the leafy sprays of the tall *Eucalypti*, and occasionally on the ground. Stomachs that I have examined contained principally caterpillars, also the smaller species of Phasmidae, and other soft-bodied insects, grasshoppers, and a few small seeds and berries. It is very destructive in orchards and vineyards, feeding upon all the softer kinds of fruits, such as mulberries, peaches, apricots, cherries, plums, and bananas. From its fondness for the former fruit, it is known in the Upper Clarence District as the "Mulberry-bird." About the vineyards at Albury it is one of the first birds to attack the grapes. Locally it is known there by the name of "Blue-bird" and "Blue Jay."

For the purposes of building it readily adapts itself to its environment, resorting to the branches of low trees inland, and to high, and sometimes the tallest trees in well frequented districts, or near the coast. The nest, which is remarkably small for the size of the bird, is built in the angle of a forked horizontal branch, frequently in bare and exposed situations, and generally near the extremity of a limb. It is a nearly flat structure, and varies in shape according to the angle in which it is built, but as a rule it is somewhat triangular in form, the rim being nearly level with or slightly above the fork in which it is placed. Sometimes it is constructed of short pieces of twig, held together with spider's web; others are formed entirely of fibrous rootlets, or the thread-like leaves of the *Casuarina*, or have thin scales of bark worked into the base, but all are firmly held together with the same material—spider's web. Some nests are without ornament of any kind, others have the exposed portion and the rim decorated with lichens. An average nest measures externally four inches and three-quarters in diameter by one inch and a half in depth, and the inner saucer-shaped depression three inches and a half in diameter by three-quarters of an inch in depth. Inland their nests are generally built in box, belar, or myall trees, as low as twelve feet from the ground; but a nest I found in a Bloodwood, at Copmanhurst, was built at an altitude of fully eighty feet. An aboriginal climbed this tree, with the aid of a vine he cut in the scrub, and the bird remained sitting until he was within ten feet of the nest. It contained three fresh eggs, and while he was engaged in taking them the female made repeated swoops at him.

The eggs are usually three, sometimes two in number for a sitting, and vary considerably in shape, size, colour, and disposition of markings. The most common types are oval or elongate-oval in form, others are much rounded at the smaller end, while specimens slightly pyriform at the narrower end are not uncommon. The shell is close-grained, and its surface smooth and as a rule very glossy. The ground colour varies from dull asparagus-green to bright apple-green, and from olive-green to pale olive-brown; in nearly all varieties, a more or less tinge of

olive pervades the green or brown ground colour. Some are uniformly blotched and spotted with different shades of umber, chestnut-brown, and indistinct underlying markings of dull inky-grey; others are blotched, streaked, and spotted with purplish-brown, chestnut-brown, and umber, the markings being confluent on the larger end and forming a zone. Minute spots, large clouded blotches, streaks, and irregular-shaped markings of different shades of reddish, purplish, or umber-brown, intermingled with similar underlying markings of violet-grey, or inky-grey, are not uncommon, the markings as a rule being very distinct from the ground colour, in others being hardly distinguishable from it. A typical sized set of three measures:—(A) 1.38 x 1 inches; (B) 1.37 x 0.78 inches; (C) 1.37 x 0.67 inches. A large set measures:—(A) 1.5 x 1 inches; (B) 1.51 x 0.66 inches; (C) 1.5 x 0.68 inches. The smallest set now before me, measures:—(A) 1.25 x 0.87 inches; (B) 1.23 x 0.87 inches; (C) 1.25 x 0.88 inches.

Dr. A. M. Morgan informs me that he has a set of four eggs in his collection taken by the late Mr. Malcolm Murray, in September, 1875, at Stone Hut, about one hundred and fifty miles north of Adelaide.

From Point Cloates, North-western Australia, Mr. Tom Carter writes me as follows:—“*Graucalus nularis* is common in the vicinity of creeks inland. I took a set of two eggs on the 14th July, 1891, and in the same year saw half-grown young ones on the 24th August.”

Young birds have the lores, feathers above and below the eye, and the ear-coverts black; those on the forehead and throat dull white, with blackish transverse bars, the chest and upper portion of the breast less distinctly barred, and the lower portion of the breast, as well as the abdomen and under tail-coverts, pure white; quills broadly edged with white in some specimens. In a further advance towards maturity, the feathers only on the throat are dull white, with indistinct blackish cross-bars. One specimen, in which the dusky bars on the throat and greyish bars on the lower breast are quite distinct, has the bases of the feathers on the forehead black.

Nidification usually commences in August, the eggs being deposited about the latter end of the month, and the breeding season continues until the end of January. The earliest record I have for eggs of this species, taken in New South Wales, is the 8th August, and the latest 2nd December.

Graucalus parvirostris.

SMALL-BILLED CUCKOO-SHRIKE.

Graucalus parvirostris, Gould, Proc. Zool. Soc., 1837, p. 143; *id.*, Handbk. Bls. Austr., Vol. I., p. 194 (1865).

Graucalus parvirostris (subsp.), Sharpe, Cat. Bls. Brit. Mus., Vol. IV., p. 32 (1879).

ADULT MALE—*General colour above grey; primaries black, the outer series narrowly edged externally with greyish-white, and the inner series broadly edged and tipped with grey, passing into greyish-white on the margin of the inner web; secundaries black, the outermost feathers broadly margined with grey, the latter colour increasing in extent towards the innermost feather, which has the outer web and tip entirely grey; two central tail-feathers dark grey, with an indistinct blackish spot towards the tip; remainder of the tail-feathers black, tipped with white, which increases in extent towards the outermost feather on either side; forehead, feathers above the eye, ear-coverts, sides of the neck and throat black, gradually passing into dark grey on the chest, and grey on the lower portion of the breast and abdomen; centre of the abdomen and under tail-coverts white; bill and legs black; “iris bluish-black” (Holden). Total length 12.5 inches, wing 8, tail 5.8, bill 0.78, tarsus 2.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Tasmania, and some of the islands of Bass Strait.

THIS insular form of *Graculus melanops*, known all over Tasmania as the "Summer-bird," can only be distinguished from examples obtained on the Australian continent by its smaller bill and slightly darker grey upper parts.

While resident at Table Cape, on the north-western coast of Tasmania, Mr. E. D. Atkinson sent me the following note: "*Graculus parvirostris* arrives at, and disappears from here, about the same time as the known migrants, but I am not sure whether it leaves the island or winters inland. I first noticed its appearance in 1884, on the 22nd September. It is distributed all along the coast country with which I am acquainted, and I have met with it on Robbin's Island and Walker Island, in Bass Strait." Recently Mr. Atkinson has noticed its arrival at Waratah, at the foot of Mount Bischoff, in September.

From Dr. Lonsdale Holden's MS. notes, made while resident at Circular Head, on the north-western coast of Tasmania, I have extracted the following information: "On the 15th February, 1887, I saw a flock of *G. parvirostris* among the low trees on the sea-shore, at the mouth of the Black River. They were very noisy, and flying to and fro; perhaps a premigration gathering. On the 12th September following I heard and saw one in the village paddock at Circular Head for the first time that spring. In the following year, I saw them in July at Circular Head; they were also observed at Boat Harbour in the same month, and they are said to be found all through the winter at Duck Bay. On the 8th September, 1886, I saw one in some scrub at Green Hills; and sixteen days later a flock of a dozen flew over the little township of Stanley, at Circular Head, from north to south; I thought they were newly arrived migrants.

"On the 14th November, 1886, I found a nest of this species, containing two fresh eggs, in an isolated gum tree on the flat at Circular Head. It was built twenty feet from the ground, in the fork of a terminal horizontal bough, not concealed by foliage at all, and was easily seen, although small for the size of the bird. It resembled a small saucer in shape, and was chiefly made of twigs, old dry herbage, and cobwebs, and lined inside with dry grass. The birds were very bold, and flew close to me, uttering their peculiar mewling cry; and even after their nest was destroyed, the birds kept flying about its site. Meanwhile they were persecuted by a family of Strong-billed Honey-eaters, which were among the trees, and kept boldly flying at the "Summer-birds." On the 2nd December, 1886, I found another nest, containing two slightly incubated eggs. The nest was on the horizontal fork of a dead branch, about fifteen feet from the ground, overhanging the South Road on the neck of Circular Head Peninsula. It was made of twigs and cobwebs, and so slight that one could see the eggs through the bottom of it. The Rev. H. D. Atkinson found a nest with two fresh eggs, on the 28th November, 1887, not far from the one taken by me in the same month of the previous year. On the 30th November, 1888, I also found one near the same spot, containing a perfectly fresh egg."

Since Dr. Holden's removal to Bellerive, near Hobart, on the south-eastern part of the island, he has noted solitary individuals in that neighbourhood in June and August, 1890. A series of skins of this species in the Australian Museum collection, was procured by Mr. J. Masters at the Ouse River in April, 1867.

The eggs are two or three in number for a sitting, and in form and colour are indistinguishable from those of *G. melanops*. All, however, I have seen are not nearly so lustrous as those of the continental species. Two eggs, taken by Dr. Holden at Circular Head, in 1886, are of a dull apple-green ground colour, which is spotted and blotched with different shades of brown, and underlying markings of dull violet-grey; the markings are almost evenly distributed over the surface of the shell, but are somewhat larger and darker on the thicker end. Length:—(A) 1.27 × 0.9 inches; (B) 1.26 × 0.91 inches. Another egg from the same locality is more rounded in form, the dull green ground colour is distinctly shaded with olive, and the spots and blotches vary in colour from rich to pale umber-brown. Length:—1.25 × 0.95 inches. Three

eggs, taken at George's Bay, on the 11th October, 1890, are elongate-oval in form, two specimens being somewhat pointed at the smaller end, the other rounded. They are of a very dull asparagus green ground colour, with numerous rounded dots and spots of different shades of brown, uniformly distributed over the shell, with which are intermingled a few underlying markings of dark purplish grey. Length: (A) 1·31 × 0·93 inches; (B) 1·34 × 0·94 inches; (C) 1·25 × 0·94 inches.

Immature birds have the bases of the feathers on the forehead black; lores, feathers around the eye, and the upper portion of the ear-coverts black; throat dark grey; chest and upper portion of the breast grey, with indistinct whitish edges to the feathers; lower portion of the breast and sides of the abdomen dull white, with greyish cross-bars; wing 7·5 inches. In a specimen showing further progress towards maturity, the feathers on the throat are changing into black, although the greyish cross-bars on the breast are still clearly visible.

The latter end of September, and the three following months, constitute the usual breeding season of this species.

Graucalus mentalis.

VARIED CUCKOO-SHRIKE.

Graucalus mentalis, Vig. and Horsf., Trans. Linn. Soc., Vol. XV., p. 217 (1826); Gould, Bds. Austr., fol., Vol. II., pl. 56 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 195 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 37 (1879).

ADULT MALE—*General colour above dark grey, slightly paler on the forehead, rump, and upper tail-coverts; primaries and outer secondaries black, edged with greyish-white; the innermost secondaries black on their inner webs, grey at the tip and on the outer webs, and externally edged with greyish-white; two central tail-feathers dark grey, with a subterminal spot of black near their tips, the remainder blackish tipped with white, their innermost feathers being washed with grey at the base, and the lateral ones narrowly edged with white on their inner webs; lores and a narrow frontal band extending half-way over the eye, and from the gape below the eye on to the upper part of the ear-coverts black; chin and throat white, passing into grey on the breast and white on the lower portion of the abdomen and under tail-coverts; axillaries and under wing-coverts white; bill and legs black; iris dark brown. Total length in the flesh 10·5 inches, wing 6·55, tail 5·2, bill 0·8, tarsus 0·95.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Queensland, New South Wales, Victoria, South Australia.

FROM the neighbourhood of Broad Sound, in Queensland, the range of the Varied-Cuckoo-Shrike extends south in suitable localities throughout New South Wales, into Northern Victoria. In the list of examples of this species, enumerated in the "Catalogue of Birds in the British Museum," three specimens, presented by the late Sir George Grey, are recorded from South Australia; one of them, an adult male, from the Murray River. Dr. A. M. Morgan and Mr. A. Zietz inform me that they have never met with it in any part of the State, but there is a specimen in the South Australian Museum obtained at Mildura, on the Murray River, in Victoria. Mildura is about fifty-five miles from the South Australian border: probably the range of the Varied Cuckoo-Shrike is limited to similar country in the adjoining portion of South Australia. The wing of an adult male obtained by Mr. George Masters at Wide Bay, Queensland, measures 6·5 inches; of an adult male from the Richmond River, New South Wales, 6·4 inches; of a nearly adult male, obtained at Cambewarra, 6·8 inches; and of a young male, shot by me at Wellington, New South Wales, 6·9 inches, the latter being the largest bird of this species I have seen. Examples from Cairns, North Queensland

* Cat. Bds. Brit. Mus., Vol. iv., p. 38 (1879).

Queensland, are slightly smaller, and lighter on the under surface, and are almost intermediate between the present species and its smaller and near ally *G. hypoleucus*.

The Varied Cuckoo-Shrike chiefly frequents open forest and thickly-timbered lands. At Wellington, New South Wales, and on the Clarence River, I met with it in pairs, resorting to the higher limbs of the tallest trees. Near Sydney I have observed, during June and July, a few of these birds on the highlands of the Milson's Point railway-line, but they are by no means common, and I have never known them remain to breed. It is unobtrusive in habits, hopping quietly from limb to limb, or leafy spray, while engaged in its search for insects or their larvæ, and occasionally uttering a low rolling note. The note of this species somewhat resembles that of its larger congener, *G. melanops*, and is difficult to syllabicate.

The stomachs of those birds I have examined, contained principally caterpillars and soft-bodied insects, small fruits, and berries. About the outlying western suburbs of Sydney, where it is an occasional visitant, and also in other parts of the State, it is known by the name of "Lesser Blue Jay."

The nest of this species is built in the angle of a forked horizontal branch, and is similar in construction to that of the Black-faced Cuckoo-Shrike, but is slightly smaller. It is somewhat triangular in shape, and is a nearly flat structure with a slight depression in the centre, and is formed of thin short pieces of twig, or the thread-like leaves of the *Casuarina*, held together with cobweb, and in some instances ornamented with lichens on the exposed outer portion and rim. An average nest measures four inches in external diameter, and one inch and a quarter in depth; and the small inner saucer-shaped depression, three inches in diameter by three quarters of an inch in depth. The nest is usually built near the extremity of a thin horizontal limb of a *Eucalyptus* or *Angophora*, at a height varying usually from twenty to sixty feet from the ground, but a bird I saw at Copmanhurst, in November, 1898, was just starting its nest in the thin fork of a grey gum at an altitude of fully eighty feet.

The eggs are two or three in number for a sitting, and vary in size, shape, colour, and disposition of markings, large eggs of this species being indistinguishable from small specimens of *G. melanops*, and eggs taken in the northern limit of its range being similar to those of *G. hypoleucus*. They are oval to rounded oval in form, the shell being close grained and its surface smooth and usually lustrous. In ground colour they vary from a dark asparagus-green to a very pale olive-green, some specimens being evenly dotted and spotted over the surface of the shell with different shades of purplish and umber-brown; others are heavily blotched with pale reddish-brown, intermingled with a few indistinct underlying markings of violet-grey. As a rule the markings are evenly distributed, but in some specimens they are larger and predominate on the thicker end. A set of three, taken at Copmanhurst, measures:—(A) 1.22 × 0.9 inches; (B) 1.28 × 0.9 inches; (C) 1.24 × 0.87 inches. A set of two, taken at Warren, measures:—(A) 1.18 × 0.85 inches; (B) 1.18 × 0.82 inches. A set of two, from Broad Sound, Queensland, measures:—(A) 1.1 × 0.82 inches; (B) 1.15 × 0.83 inches.

Immature birds have the head, hind-neck, throat, sides of the neck, and chest black; the feathers of the breast and upper portion of the abdomen with blackish centres or sagittate markings. Gradually these black feathers change into grey, first on the crown of the head and hind neck, then on the feathers of the throat and chest, which have whitish edges. In slightly older birds, signs of immaturity remain in the black mottlings to the feathers on the sides of the neck and chest, and indistinct dusky barrings to the feathers of the breast. The last traces of youth are exhibited in the ear-coverts, which have dusky bases or centres, and are somewhat darker than in the fully adult bird. Immature birds were obtained by Mr. George Masters in the first of the above described stages of plumage at Rope's Creek, about thirty miles from Sydney, in January, and a similar specimen was obtained by me, at Wellington, New South Wales, in July.

In similarly describing the young of this species, Gould truly remarks:—"There is no one member of the family to which it belongs which undergoes so many changes of plumage as *Graucalus mentalis*, and it is consequently very puzzling to the ornithologist." From a series of eleven birds now before me, obtained in various parts of New South Wales at different seasons of the year, I have described above what I believe to be immature plumaged examples, although the average wing measurement equals that of the adult. All have more or less black or partially black feathers, either on the crown of the head, ear-coverts, sides of the neck, throat, and fore-neck, or on all of these parts; and to a certain extent this stage of plumage is also exhibited in some paired birds during the breeding season. Probably only very old birds are entirely destitute of black feathers on these parts, for in fifteen specimens now before me, only four show no traces of them. It is remarkable that the young and adult stages of plumage of *Graucalus melanops* and *G. mentalis* should be exactly reversed; the crown of the head, throat, and fore-neck of the former gradually passing from grey in the young to black in the adult, while that of *G. mentalis* changes from black in the young to grey in the adult.

In the neighbourhood of Penrith, on the Nepean River, these birds commence to build about the middle of August. At Copmanhurst I saw them building on the 6th November, although eggs have been taken there on the 7th of that month; and at Broad Sound, Queensland, fresh eggs have been found as late as the 12th December.

Graucalus hypoleucus.

WHITE-BELLIED CUCKOO-SHRIKE.

Graucalus hypoleucus, Gould, Proc. Zool. Soc., 1848, p. 38; *id.*, Bds. Austr., fol., Vol. II., pl. 57 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 196 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 36 (1879); Salvad., Orn. Pap. et Molluc., Pt. II., p. 136 (1881).

ADULT MALE.—General colour above grey, lighter on the forehead, rump, and upper tail-coverts; primaries black, externally edged with greyish-white; secondaries black, washed with grey on their outer webs, and externally edged with greyish-white, the innermost feather entirely grey on the outer web; two central tail feathers grey, with a blackish wash on their apical half, the remainder blackish tipped with ashy-white; lores, and a narrow frontal band extending about half-way over the eye, and from the gape below but not beyond the eye, black; throat white, passing into pale greyish-white on the chest; remainder of the under surface, the under tail and under wing coverts pure white; bill and legs black; iris dark brown. Total length 9·5 inches, wing 5·75, tail 4·2, bill 0·88, tarsus 0·9.

ADULT FEMALE.—The sexes are alike in plumage.

Distribution.—North-western Australia, Northern Territory of South Australia, North Queensland, Islands of Torres Strait, New Guinea, Aru Islands.

THE type of this species was described by Gould from a specimen procured at Port Essington. It has a wide distribution, being found near Wyndham, North-western Australia; at Port Darwin, Port Essington, and Cape York, in Northern Australia; also on the islands of Torres Strait, New Guinea, and the Aru Islands. From *Graucalus mentalis* it can only be distinguished by its smaller size, more delicate grey upper parts, and by the black feathers below the eye not extending on to the upper portion of the ear-coverts, as in that species. All the Australian typical examples I have examined are from the northern portions of the continent. Specimens from Cooktown, on the north-east coast of Queensland, are somewhat larger and darker on the under parts; and from localities further south appear to completely intergrade with *G. mentalis*. I have never observed, however, any

immature specimens of *G. hypoleucus* showing traces of the black head and chest of that species. Specimens from Port Moresby, New Guinea, are slightly whiter on the under surface, and smaller than examples from Northern Australia.

Mr. J. A. Thorpe obtained numerous examples at Cape York in 1867-8; and Mr. George Masters also obtained specimens in the same locality, and at Cape Grenville, during the voyage of the "Chevert" in 1875.

From Wyalla, about thirty miles south of Cooktown, Mr. Frank Hislop writes: "The White-bellied Cuckoo-Shrike is common in the open forest lands, and I have often met with it in timbered pockets on the mountains. Its food consists of insects and fruits, principally the smaller species of figs; it is also very fond of chillies. The nest, which is nearly flat, is chiefly composed of short pieces of twig and strips of bark, fastened together with cobwebs, and is always placed in the junction of a forked horizontal branch, more often near the extremity of a limb. They build generally in the bloodwood and beefwood trees, at a height varying from fifteen to thirty feet from the ground. The breeding season commences in October, and lasts until the end of January."

The eggs, usually two, sometimes three in number for a sitting, are not to be distinguished from small eggs of *G. mentalis*. In addition to the previously described varieties of the eggs of the latter species, a common type among the eggs of *G. hypoleucus* has a rich bluish-green ground colour, with heavy blotches of purplish-brown or reddish-umber, distributed over the larger end of the shell, and intermingled with similar faint underlying markings of a paler shade. A set of two, from Cape York, measures: (A) 1.07×0.8 inches; (B) 1.08×0.8 inches. A set of two, taken near Cooktown, measures: (A) 1.1×0.8 inches; (B) 1.12×0.81 inches.

Genus PTEROPODOCYS, Gould.

Pteropodocys phasianella.

GROUND CUCKOO-SHRIKE.

Graucalus phasianellus, Gould, Proc. Zool. Soc., 1839, p. 142.

Pteropodocys phasianella, Gould, Bds. Austr., fol., Vol. II., pl. 59 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 199 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 22 (1879).

ADULT MALE.—*Head, hind-neck, mantle, and upper portion of the back, grey; lower back, rump, and upper tail-coverts white, crossed by narrow transverse black lines; wings black, the lesser coverts dark grey; tail feathers black, white at the base, the outer feather on either side broadly tipped with white; small feathers around and below the eye grey, tipped with white; ear-coverts blackish-grey, with indistinct whitish cross-lines; throat, sides of the neck, and chest grey, passing into white on the remainder of the under surface, which is crossed with narrow transverse black bars; centre of the lower abdomen, under tail-coverts, and acillaries white; bill black; legs and feet black; iris straw-white. Total length in the flesh 14 inches, wing 8.2, tail 7, bill 0.8, tarsus 1.5.*

ADULT FEMALE.—*Similar in plumage to the male.*

Distribution.—Queensland, New South Wales, Victoria, Central Australia, Western Australia.

THE Ground Cuckoo-Shrike is essentially an inhabitant of the inland portions of the States. Dr. W. Macgillivray informs me that it is common at Cloncurry, in the Burke District, North Queensland. Mr. K. Broadbent has recorded it from Barcaldine, about three hundred and fifty miles west of Rockhampton; and its range extends south throughout the inland districts of New South Wales, into the north-western parts of Victoria, and doubtless the adjoining portion of South Australia, although Dr. A. M. Morgan and Mr. A. Zietz

inform me that they have never seen or heard of its being obtained in the southern parts of the latter State. It was met with by the Horn Scientific Expedition at Crown Point and many places along the Finke River, in Central Australia; Mr. Edwin Ashby observed a flock at Callion, about eighty-five miles north of Coolgardie; and Mr. George Masters obtained specimens near the Salt River, about fifty miles from Perth, Western Australia. An adult male from the latter locality has the cheeks, throat, fore-neck, and chest of a darker grey than typical eastern examples, but a similar specimen was procured by the late Mr. K. H. Bennett, at Mossgiel, New South Wales. The wing measurement varies from 7.7 inches to 8.4 inches, the foregoing description being taken from a fine old adult male shot by me near Moree.

In North-western and Western New South Wales it is a resident species, and although widely distributed is by no means numerous. It frequents chiefly large open grassy plains dotted here and there with low bushes and lofty trees, or sparsely timbered forest country contiguous to them. Near the Namoi and Gwydir Rivers, I met with it sometimes singly, or in pairs, but more often in small flocks of four or five in number, passing most of its time on the ground, over which it runs with remarkable celerity in search of insects and their larvæ, which constitute its food. It is usually very shy and wary, and exceedingly difficult to approach, more especially while on the ground.



GROUND CUCKOO SHRIKE.

At Tyree Station, on the Gwydir River, I shot an adult male, female, and a young female, on the 9th November, 1897. These birds were part of a flock of five, and a friend had kindly driven me a long distance over the plains while in pursuit of them. I had a similar experience a few days later, on Weebollabolla Station, while accompanied by Mr. C. J. McMaster, the birds when disturbed flying fully a quarter of a mile before settling again on the open plain. I secured a young male, and found that these flocks usually consisted of an adult pair of birds accompanied by their young.

The shrill notes of this species are usually uttered during flight, and somewhat resemble those of the Black-breasted Plover (*Sarcophorus tricolor*).

The late Mr. K. H. Bennett found many nests and eggs of this species; and there is a fine series of eggs, also young in all stages of plumage, in the Australian Museum, collected by him during his long residence in the western portion of New South Wales.

The nest, which is built on a horizontal forked branch, resembles that of *Graculus melanops*, but is somewhat larger and deeper, being composed externally of dried blades or stems of grasses, thin fibrous roots, and bark fibre, bound together with spider's web; the shallow saucer-like cavity being lined with wool, fur, or other soft material. An average nest measures externally five inches in diameter by two inches in depth, the inner cavity three inches and three-quarters in diameter by one inch in depth. Some nests are larger, and built through out of softer material. One now before me, taken by the late Mr. K. H. Bennett, at Yandembah Station, is a thick, rounded, mattress-like structure, formed principally of wool, with which is intermingled plant-stems, fine rootlets, dried grasses, and a few feathers; it measures externally six

inches and a half in diameter by three inches in depth, the saucer-shaped depression measuring three inches and three-quarters by a depth of one inch and a half. The nests in New South Wales are usually built in a *Eucalyptus* or *Casuarina*. Generally the site selected is a horizontal branch of a lofty tree, but the height varies from twenty to seventy feet from the ground. Near Moree, in November, 1897, I saw an old mud tenement of the Magpie-Lark taken possession of by this species as a nesting-place.

The eggs are usually three, and occasionally only two in number for a sitting. They vary in form from oval to elongate oval, some specimens tapering sharply towards the smaller end, the shell being close-grained and its surface smooth and glossy. In ground colour they vary from olive-green to dull asparagus and bright bluish-green, which is finely and closely freckled, as a rule, over the entire shell, with indistinct markings of olive-brown; in some specimens the freckles are confluent, and form clouded patches or a cap on the larger end. Typical eggs are of a dull asparagus-green ground colour, which is more or less obscured with numerous indistinct fleecy markings of olive-brown. A set of three measures: Length (A) 1.33 × 0.93 inches; (B) 1.33 × 0.95 inches; (C) 1.35 × 0.95 inches. An unusually small set of two, taken by the late Mr. K. H. Bennett, at Ivanhoe, in October, 1886, and of a bright bluish-green ground colour, measures: (A) 1.2 × 0.85 inches; (B) 1.18 × 0.83 inches.

The nestling has the general colour above fawn-brown, crossed by dull blackish transverse lines; the concealed portions of the feathers of the head, hind-neck, mantle, and back grey, and those of the rump and upper tail-coverts white; wings dull black, the inner primaries and the secondaries largely tipped with fawn-brown; tail black, the outer feather on either side and the two central ones tipped with fawn; throat dull white with narrow blackish bars; fore-neck and chest grey, alternately barred with pale fawn and black; feathers of the remainder of the under surface white, largely tipped with fawn-brown and crossed with black transverse lines; centre of the abdomen and under tail-coverts white, washed with fawn. A slightly older bird taken from the nest, near Mossgiel, on the 26th October, 1886, by the late Mr. K. H. Bennett, has lost most of the fawn tips to the feathers on the upper parts and chest, being replaced by the grey basal colour which has now nearly encroached to the tip; lower portion of the abdomen and under tail-coverts white, the latter crossed with a few narrow blackish transverse bars; "bill dark horn colour; legs and feet horn colour; iris dark brown" (Bennett). Wing 5.2 inches. A young male, shot by me at Moree on the 9th November, 1897, is like the adult, but has some of the feathers on the head, hind-neck, and mantle tipped with dull white and crossed with blackish transverse lines; primaries and secondaries black, edged with white at the tips; tail-feathers black with whitish tips, the outer one on either side broadly tipped with white; throat and fore-neck grey, the latter crossed with dull blackish transverse bars; bill black, legs and feet dark grey, iris dark brown. Total length in the flesh 13 inches, wing 7.7.

In Central and Western New South Wales, it is an early breeder, several nests with full sets of eggs being taken by the late Mr. K. H. Bennett, at Yandembah and Mossgiel, during the first week in August, but the greater number of eggs may be usually found in October. In the tablelands of the Mudgee District, Messrs. Cox and Hamilton state that "sometimes this species is rarely seen for years, at other times it is common all the year round, but usually leaves early in winter and returns in spring. For this reason it is known as 'Spring-bird.' We have taken eggs in November and December, and noted young birds leaving the nest on January 20th."

Genus **EDOLIISOMA**, *Pucheran*.**Edoliisoma tenuirostre.**

JARDINE'S CATERPILLAR-EATER.

Graucalus tenuirostris, Jard., Edin. Journ. Nat. & Geog. Sci., No. 4, n.s., p. 211.*Campophaga jardiui*, Gould, Bds. Austr., fol., Vol. II., pl. 60 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 200 (1865).*Edoliisoma tenuirostre*, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 55 (1879); North, Rec. Austr. Mus., Vol. I, p. 177 (1891).

ADULT MALE—General colour above and below dark slaty-grey; lesser wing-coverts like the back; median wing-coverts black at the base, dark slaty-grey at the tip; primaries black, externally edged with grey; secondaries and greater wing-coverts black, broadly margined on their outer webs with grey; two central tail-feathers dark slaty grey with a spot of black near the tip, the remainder black, the outer one on either side tipped with slaty-grey; lores, feathers below the eye, and the ear-coverts black; bill black; legs and feet black; iris dark brown. Total length in the flesh 10·6 inches, wing 5·5, tail 4·1, bill 0·82, tarsus 1.

ADULT FEMALE—General colour above ashy-brown, the feathers of the rump and upper tail-coverts more conspicuously shaded with grey, and having pale yellowish-buff edges and an indistinct blackish subterminal cross-bar; primaries, secondaries, and upper wing-coverts brown, externally margined with buff; two central tail-feathers brown, washed with buff, the remainder olive-brown tipped with rich creamy-buff, increasing in extent towards the outermost feather on either side, which has the outer web creamy-buff, except at the base; a line of feathers above and around the eye creamy-buff; a spot in front of the eye and the ear-coverts blackish, the latter streaked with pale creamy-buff; chin, throat, and all the under surface creamy-buff; the feathers of the chest, breast, and sides of the body crossed with two arrow-head blackish lines; under tail-coverts and under wing-coverts rich creamy-buff. Total length in the flesh 9·8 inches, wing 5·1, tail 4·1, bill 0·8, tarsus 0·95.

Distribution.—Northern Territory of South Australia, Queensland, New South Wales, Victoria.

THIS species is distributed in favourable situations throughout the greater portion of Northern and Eastern Australia. Gilbert met with it at Port Essington, Mr. K. Broadbent at Cape York, Mr. E. A. C. Olive procured examples at Cooktown, Messrs. Cairn and Grant obtained it at Cairns, and Mr. George Masters at Port Denison. To New South Wales it is a spring visitant, departing again at the end of summer, when the breeding season is over. During these seasons it is by no means uncommon in the northern coastal districts. South of the Hawkesbury River it is less frequently met with until the Mlawarra District is reached, except in the contiguous mountain gullies of the National Park and Waterfall. In the south-eastern portions of the State, and in Southern Victoria it is a comparatively rare species. It evinces a decided preference for the taller trees in rich brush lands or humid mountain ranges and gullies, and is seldom met with far inland. During November, 1898, in company with Mr. George Savidge, I found it tolerably plentiful in the Upper Clarence District, resorting generally in pairs to the topmost branches of the highest trees, its presence being detected chiefly by the peculiar note of the male, resembling “kree-kree, kree-kree” rapidly uttered, and which could be heard a considerable distance away. In November of the following year I observed the males only of this species in the loftiest trees growing in the palm brushes at Ourimbah, a few miles north of the Hawkesbury River. Evidently the females were sitting, for I saw and heard the males day after day in the same places, and from which they chased all other birds. The dense undergrowth, covered with bush-lawyer vines, however, precluded

the possibility of making a thorough search for their nests at any distance from the roads or tracks made by the timber-getters.

The food of this species consists of insects and their larvæ.

During the latter end of September, 1882, Mr. C. C. L. Talbot observed a pair of these birds building their nest in the angle of a forked horizontal branch of an ironbark, about forty feet from the ground, on Collaroy Station, Broad Sound, five hundred and fifty-six miles north of Brisbane. From this nest, a week after, Mr. Talbot secured a single egg, the first I had seen, and the only occasion I had known of its being taken. Subsequently Mr. G. E. Shepherd found several nests at Mornington, Victoria, each of which contained a single egg, the normal sitting. These nests were built in either a *Eucalyptus*, *Casuarina*, or *Banksia*. In every instance the females sat very close, and one almost allowed him to touch her before she left the nest. Mr. Shepherd forwarded me a nest and egg of *E. tenuirostre*, together with the following note:—"I have taken the nest and egg of one pair of birds on four occasions. The first I took on the 18th December, 1896; the second on the 27th December; the third on the 8th January, 1897; and the fourth on the 10th of the same month; so you will see what persistent breeders they are. The only sound I have heard the female utter is a cluck-like note when I have frightened her off the nest."

From the Upper Clarence River, Mr. George Savidge writes as follows:—"Jardine's Caterpillar-eater usually arrives in this locality about the middle of October. There are now four pairs of these birds calling within hearing of my house. Each pair have a certain domain of their own, and during the breeding season resent the intrusion of any other species, attacking even Magpies and Laughing Jackasses, until they drive them from the neighbourhood. It is entirely owing to this pugnacious character that I have been able to locate the proximity of their nests, but even then they are extremely difficult to discover on account of their diminutive size. When not engaged in fighting or chasing other birds, the male generally flies off to a great distance before one gets near the tree in which the nest is built, the female in the meantime slipping quietly off and stealing away unobserved. At other times the female sits perfectly upright on the nest and will not leave it until one is half-way up the tree. I robbed the nests of a pair of these birds three times during January and February, 1899, first of a young one and subsequently on two occasions of a single egg. The female does not lay again in the same nest after being robbed, but the birds generally build in a tree near at hand, the nest being completed and the egg deposited within ten or twelve days. They build in any rough-barked tree: I have found their nests in Bloodwoods, Ironbarks, Stringybarks, Oaks, Apple-trees (*Angophora subclutia*), and the Native Quince (*Petalostigma quadriloculare*), at heights varying from twelve to forty feet from the ground. I have taken twelve nests, with an egg in each, and found seven with young. Nidification, in which both sexes take part, commences early in November, and the breeding season continues until the end of February."

I observed these birds for the first time in the vicinity of Sydney, at Roseville on the 28th October, 1900; arriving again on the same date in the following year. The male of a pair which have each season tenanted the trees opposite my house, used to commence calling as early as 5 a.m., and at prolonged intervals kept it up for two hours. Seldom did I hear it call throughout the day. The male, in addition to its frog-like note, utters a low chirrup and a sweet clear note like that of *Artamus superciliosus*. Although the male is usually pugnacious, he sometimes meets his match. On the 23rd December, 1900, I saw one chasing a Yellow-tufted Honey-eater backwards and forwards through the trees. Suddenly the pursuer became the pursued, and finally left the Honey-eater in possession of the field. A nest of this species, found at Roseville, on the 30th November, 1901, was built in a forked horizontal branch of a Forest-oak (*Casuarina suberosa*), at a height of thirty feet from the ground, and contained a

heavily incubated egg, but which I managed successfully to empty of its contents. These birds leave the district again about the middle of January.

The nest, a small open shallow structure, is fitted into the angle of a forked horizontal branch, and is constructed throughout of lichens intermingled with short pieces of very thin plant stems or the thread-like leaves of the *Casuarina*, and held together with spiders' web; the rim of the nest, which stands slightly above the branch, being thickly coated with lichens, and the saucer-like cavity lined entirely with fine dried plant stems or portions of *Casuarina* leaves. In three nests now before me, one built in a Bloodwood has the rim nearly level with the thick forked branch in which it is fitted; another, in a Native Quince, has a few pieces of green moss worked into it, and the rim slightly raised above the branch; and the third, in a bent fork, has one side of the nest built up level to a height of one inch and a quarter. An average nest measures externally three inches and a quarter in diameter; internally two inches; depth half an inch. Only one egg is laid for a sitting; they vary in form from oval to ellipse and elongate-oval, and in ground colour from very pale bluish and greenish-grey to green. The variety



NEST AND EGG OF JARDINE'S CATERPILLAR EATER.

slaty-brown, uniformly distributed over the surface of the shell, and intermingled with underlying spots and blotches of slaty-grey. In the colour and disposition of its markings this variety resembles the egg of *Sittella chrysoptera*, but is nearly twice the size. Some specimens have the markings much darker, and an irregular zone on the thicker end. A typical egg measures 1.21×0.87 inches; an elongate specimen 1.3×0.85 inches. A rare variety, obtained by Mr. George Savidge, and

now in the collection of Mr. Joseph Gabriel, is like a miniature Crow's egg. It is oval in form, and of a dull green ground colour, which is uniformly spotted and dotted with different shades of yellowish and blackish-brown, except on the larger end, where the ground colour is almost obscured by a broad clouded band of dull yellowish-brown. Length:— 1.24×0.86 inches. This egg is represented on Plate B. III., Figure 14. Figure 13 is from Mr. George Savidge's collection. An egg, taken at Roseville, on the 30th November, 1901, measures:—Length 1.23×0.84 inches.

A nestling, taken by Mr. Savidge, has the feathers of the upper parts brown, slightly darker on the head, and all largely tipped with white; wings dark brown, the secondaries broadly edged with light rufous; tail-feathers buff, with blackish cross-bars; all the under surface dull white, the feathers of the chest and breast with a blackish shaft-line terminating in a tear-shaped spot near the tip; bill fleshy-brown; legs and feet pale fleshy-brown. Total length 4.7 inches, wing 2.25.

The nest and egg figured above were taken by Mr. Savidge at Copmanhurst, on the Upper Clarence River, on the 8th January, 1899.

Genus **LALAGE**, Boie.**Lalage leucomela.**

WHITE-EYEBROWED CATERPILLAR-EATER.

Campophaga leucomela, Vig. and Horsf., Trans. Linn. Soc., Vol. XV., p. 215 (1826).*Campophaga leucomela*, Gould, Bds. Austr., fol., Vol. II., pl. 62 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 203 (1865).*Lalage leucomelana* (*partim*), Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 106 (1879).

ADULT MALE—*General colour above glossy black; feathers of the rump grey, with a subterminal spot or bar of black; upper tail-coverts grey; tail black, the lateral feathers tipped with white, which increases in extent towards the outermost feather; lesser wing-coverts black, the median series white except at the base; the greater coverts black, with an oblique white tip; quills black, the secondaries externally edged with white; a line extending from the nostril over the eye pure white; a triangular-shaped patch in front of the eye black; chin, throat, cheeks, and ear-coverts white, passing into faint greyish-white on the remainder of the under surface, which is slightly tinged with orange-buff; under tail-coverts orange-buff; under wing-coverts pure white; bill and iris dark brown; legs and feet dark grey. Total length 2.5 inches, wing 3.4, tail 3.2, bill 0.52, tarsus 0.82.*

ADULT FEMALE—*General colour above blackish-grey; rump and upper tail-coverts brownish-grey, with greyish-white tips to the feathers; quills and upper wing-coverts dark brown, and similarly marked with white as in the male; eyebrow not so distinct; ear-coverts white, mottled or edged with black; chin and centre of the throat white; remainder of the under surface greyish white, washed with ochraceous buff and crossed with narrow wavy black lines, except on the centre of the abdomen which with the under tail-coverts is a deep ochraceous buff; under wing-coverts white, tinged with ochraceous buff. Total length 2.5 inches, wing 3.4, tail 3.2, bill 0.55, tarsus 0.8.*

Distribution. Northern Territory of South Australia, Queensland, North-eastern New South Wales.

THE range of this species extends from Port Essington, in Northern Australia, to Cape York, and throughout all the coastal districts of Eastern Queensland into North-eastern New South Wales. I have specimens now before me from Port Essington, Cape York, Cooktown, Cairns, Port Denison, Wide Bay, Brisbane, Richmond River, and Bellinger River, and find little or no variation in their plumage. The wing of adult males from Cape York and Cooktown measures 3.8 inches; from Gayndah, Queensland, 4.3 inches; from the Bellinger River, New South Wales, 3.8 inches.

As Count Salvadori* points out, the present species is distinct from *Lalage kuru*, and Dr. Sharpe was in error in the "Catalogue of Birds in the British Museum,"† in regarding them as one species. Subsequently, in his Report on the Birds collected during the "Voyage of H.M.S. Alert,"‡ Dr. Sharpe apparently holds the same views as Count Salvadori.

The type of *Lalage kuru* was obtained in New Ireland; that of *L. leucomela* from Broad Sound, Queensland. I have never seen *L. kuru* from any part of the Australian continent. Specimens from the Laloki River, New Guinea, may be distinguished by their more broadly-barred under parts, less extent of white on the upper wing-coverts, and the very distinct white margins to the feathers of the rump.

I met with a few examples of *L. leucomela* in the Upper Clarence District, in November, 1898. It had just arrived in that district, and was not apparently breeding during my stay there.

* Orn. Pap. et Molucc., Pt. ii., p. 163 (1881).

† Cat. Bds. Brit. Mus., Vol. iv., p. 106 (1879).

‡ Voy. Alert, p. 13 (1884).

From North-eastern Queensland, Mr. E. A. C. Olive kindly forwarded me an adult male and female of this species, together with the following notes:—"These birds are numerous in the Cooktown District, and frequent the trees in the garden about my cottage, feeding on caterpillars and the fruit of a native fig-tree. The branches of one of these trees overhangs my verandah, so I am able to watch them within a distance of three yards. For nine months of the year they appear to go in pairs; but during our cool months—June, July, and August—they assemble in small flocks of about twelve in number, and frequent the grass and low bushes. They utter a note, not unlike that of the Eastern Bower-bird (*Chlamydodera orientalis*), but the sound is softer and more rolled. In November and December they build, making a nearly flat nest, very like that of *Graucalus melanops*, but exceedingly small in proportion to the size of the bird. Generally it is built in the fork of a small tree or shrub, about ten feet from the ground, and only one egg of a light green ground colour, with reddish-brown blotches, is deposited for a sitting."

The nests of birds of this genus, although resembling miniature tenements of the different species of Cuckoo-Shrike, are usually built on thinner forked branches, and have the outer portion of the nest worked over and around the branch on which they are placed. The first nest and egg I saw of this species, were taken by Mr. R. D. Fitzgerald near Ballina, at the mouth of the Richmond River, on the 4th November, 1887, and were described by him in the same year.*

The nest is an open, shallow, and exceedingly small structure, and is built at the junction of a thin forked horizontal branch, near the extremity of a limb. One now before me is formed of fine plant stalks, wiry rootlets, and dried grasses; the rim, outer portions of the nest, and the fork on which it is built being thickly coated with spider's web. It is of just sufficient size to hold one egg, and is actually smaller than the nest of its lesser congener *L. tricolor*, measuring two inches and one-eighth in external diameter by one inch and a quarter in depth, and internally one inch and a third in diameter by three-quarters of an inch in depth.

Only one egg is laid for a sitting. They vary from oval to an ellipse in form, the shell being close-grained and its surface smooth and slightly lustrous. The ground colour varies from bright apple-green to pale green, and is uniformly blotched, spotted, or marked with small irregular-shaped streaks of reddish or chestnut-brown, in some specimens the markings being larger and predominating on the thicker end of the shell, where they assume the form of a well defined zone. Two eggs measure as follows:—(A) 1×0.73 inches; (B) 0.97×0.68 inches. These eggs are not to be distinguished from those of the next species, *L. tricolor*, except for their larger size.

In Eastern Australia the breeding season commences in October, and continues until the middle of February.

Lalage tricolor.

WHITE-SHOULDERED CATERPILLAR-EATER.

Ceblepyris tricolor, Swains., Zool. Journ., Vol. I., p. 467 (1825).

Campephaga humeralis, Gould, Bds. Austr., fol., Vol. II., pl. 63 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 204 (1865).

Lalage tricolor, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 92 (1879); Salvad., Orn. Pap. et Mollucc., Pt. II., p. 160 (1881).

ADULT MALE—General colour above glossy greenish-black; quills black; lesser, median, and inner greater wing-coverts white, the latter with a mesial streak of black except at the tip; outer series of the greater wing-coverts black, narrowly edged with white; the secondaries externally margined with white;

* Proc. Linn. Soc. N.S.W., 2nd ser., Vol. ii., p. 971 (1887).

lower back, rump, and upper tail-coverts light grey; tail black, the three outermost feathers tipped with white; cheeks, ear-coverts, sides of the neck, all the under surface, and under tail and under wing-coverts pure white; bill and legs black; iris dark brown. Total length in the flesh 7 inches, wing 4, tail 3, bill 0.53, tarsus 0.8.

ADULT FEMALE—General colour above brown, the feathers of the head with dusky centres; quills brown, the upper wing-coverts and outer webs of the secondaries margined with buff; tail brown, the lateral feathers tipped with dull white; a line in front and behind the eye blackish-brown; an indistinct eye-brow buffy-white; chin, throat, and centre of the abdomen dull white; remainder of the under surface buffy-white, with indistinct dusky-brown cross-bars on the sides of the breast and body; under tail-coverts white, slightly tinged with buff; bill dark brown, basal portion of lower mandible yellowish-horn colour; legs and feet greyish-black; iris dark brown. Total length in the flesh 7 inches, wing 3.9, tail 3, bill 0.52, tarsus 0.8.

Distribution. All the Australian States. South-eastern New Guinea.

IN suitable situations the present species is found, in one season or another, in nearly every part of the Australian continent. In Eastern New South Wales these birds are strictly migratory, arriving in the neighbourhood of Sydney, generally during the first week in September, remaining to breed, and accompanied by their young, departing again in February. In 1868 they left Canterbury, where they were very numerous, on the 14th January, but this was earlier than usual. In Western New South Wales, the late Mr.



WHITE-SHOULDERED CATERPILLAR-EATER.

K. H. Bennett obtained at Moolah two immature males, one in June, the other in July of 1883. Mr. George Masters procured a nearly adult male in August, at Gayndah, in Queensland, and also obtained specimens at King George's Sound, Western Australia, in November. A number of young birds were met with by the members of the Calvert Exploring Expedition in the same State, near Lake Way, in July, 1896; and, later on, Mr. G. A. Kearnland found them breeding close to the Fitzroy River in North-western Australia, in February. Examples were also obtained in 1886 in the same neighbourhood by Mr. E. J. Cairn and the late Mr. T. H. Bowyer-Bower. I have specimens in immature or adult plumage now before me from all parts of the continent except Central Australia. It was probably due to there being a drought in Central Australia in 1894 that this species was not met with by the Horn Scientific Expedition. During a trip made in

South Australia by Dr. A. M. Morgan, in July and August, 1900, he observed two immature males at Elizabeth Creek, about one hundred and twenty miles north-west of Port Augusta.

The wing-measurement of adult males varies from 3.85 inches to 4.1 inches. By a typographical error in the "Catalogue of Birds in the British Museum," the wing and tail measurement of the adult male of *Lalage tricolor* is there represented as exceeding the measurements of the same parts in *L. leucomela*.

On the highlands of the Milson's Point railway-line, near Sydney, it is worthy of note that this species does not make its appearance until nearly a month later than it does in the western suburbs of Ashfield and Canterbury. These birds generally return to the same haunts year after

year. They frequent chiefly open forest and partially cleared lands, and are usually met with in pairs. The male, with its strikingly contrasted black and white plumage and rich and melodious song, being the first to attract one's attention; the sombrely attired female, harmonising with its surroundings, being more difficult of detection.

The voluble notes of the male are usually uttered while flying from tree to tree, and somewhat resemble those of the Brown Fly-catcher (*Micraca fascians*) but are louder and deeper. The remarkably small nest of this bird, too, would often escape observation, were not the attractive song of the male frequently poured forth while perched on a branch close to it.

The food consists entirely of insects and their larvæ, obtained chiefly among the leaves of trees, and sometimes on the ground. Although frequenting orchards, I have never known it to attack the fruit like the larger members of the family CAMPOPHAGIDÆ.

During a visit paid to Moree in November, 1897, by Mr. J. A. Thorpe and myself, we found this species the commonest bird in the neighbourhood, being even more plentiful than the White-eyebrowed Wood Swallow (*Artamus leucorhynchus*). It was breeding freely, and there was a nest in a Bastard Myall (*Acacia cunninghami*) within a few yards of my window. The female used to sit in the early morning, being relieved by the male throughout the greater part of the day, and resuming the duties of incubation again in the evening and through the night. In the same tree was a nest of the Black and White Fantail (*Sauleprocta melaleuca*). Another instance of the female relieving the male at night, during the task of incubation, I observed at Roseville. A nest which I found in course of construction in a low forked branch of a Rough-barked Apple-tree (*Angophora intermedia*), on the 28th October, 1901, by seeing the female fly to it, although I only saw the male actually building it, was finished on the 4th November. After the eggs were deposited, whenever I passed it in the daytime I found the male sitting, but at dusk his place was taken by the female. Evidently the male was not near at hand, or disregarded her cries of alarm, when I drew the branch down and frightened her off the nest.

The nest, a small open shallow structure, is built at the junction of a two or more pronged horizontal branch, occasionally in a perfectly upright fork, but more often in a slightly leaning pronged branch, and generally towards the extremity of a limb. It is formed of very fine fibrous roots or dried grasses, the rim and the fork in which it is built being thickly coated with spider's web. The nests are variable in size, according to the position in which they are built: those on horizontal forks being as a rule larger than those placed in upright branches. At Chatswood, near Sydney, on the 28th November, 1898, I saw the male of a pair of these birds, who had been robbed of their eggs, commencing to build again in a thin forked horizontal branch of a sapling about fifteen feet from the ground. This nest I had under daily and almost constant observation, and the male alone constructed it so far as I could ascertain, in fact I never saw the female of this pair of birds at any time. On the 3rd December I saw the male sitting on the nest, and also three days later when it contained two perfectly fresh eggs. Although this nest was quickly built, it is more compactly constructed and far neater in appearance than the first nest, built in an upright fork near the top of a *Syncarpia*. It is formed at the junction of a very thin three-pronged leafy branch, and is outwardly composed of fine pliant plant stems, lined inside with fine dried grasses; the outer portion of it, the fork on which it is placed, and the rim being coated with spider's web and ornamented with a few small leaves of a climbing plant. Externally it measures two inches and a half in diameter by one inch and a quarter in depth; the inner saucer-shaped cavity measuring two inches in diameter by three-quarters of an inch in depth. The site of the nest varies very much; inland it is frequently built in a hop bush or emu-bush, as low as four feet from the ground. Near the coast it is more often built in a gum, apple, oak, or turpentine-tree at a height from fifteen to thirty feet, but not infrequently at an altitude of sixty or seventy feet. The eggs are

two or three in number for a sitting, and are typically oval in form, the shell being close-grained and its surface slightly lustrous. The ground colour varies from light green to rich bluish-green, which is uniformly blotched or marked with short irregular shaped streaks of reddish or chestnut-brown, in some specimens almost obscuring the ground colour, and in rare instances confined almost entirely to the larger end, where a perfect zone or cap is formed. A set of two measures:—Length (A) 0.87×0.65 inches: (B) 0.86×0.66 inches. A set of three:—(A) $0.82 \times$ inches: (B) 0.83×0.65 inches: (C) 0.82×0.66 inches.

A nestling taken at Roseville on the 5th December, 1900, I fed upon finely cut pieces of raw meat, and it lived four days. It was extremely tame, and used to perch on my finger while preening its feathers. The general colour above is brown, with fulvous white tips to all the feathers; rump greyish-brown, all the feathers indistinctly barred with brown and tipped with dull white; primaries, secondaries, and upper wing-coverts brown, broadly edged with fawn, whitish at the tips; ear-coverts dull white; all the under surface dull white, the feathers on the throat and chest having dusky brown centres.

The young male has the head, hind-neck, and upper part of the back rich brown; feathers of the lower back, rump, and upper tail-coverts grey with brownish tips; quills and upper wing-coverts black, the latter broadly edged with ochraceous-buff; the secondaries externally margined, and the primaries narrowly tipped with white; tail black, the two central feathers margined with white on their apical portion, and the remainder tipped with white; under surface buffy-white, darker on the sides of the body, which is crossed with indistinct dusky brown bars. In the semi-adult male, the feathers on the crown of the head have central streaks of black, and those of the mantle and upper portion of the back a large subterminal spot of black; the ochraceous-buff edges to the upper wing-coverts are much broader, there is a buffy-white stripe over the eye, more distinct than in the adult female, and all the under surface is white, slightly tinged with yellowish-buff, and crossed with almost invisible dusky-brown bars on the sides of the chest. In the not quite adult male, the last trace of immaturity is exhibited in a few brown feathers being intermingled with the glossy black ones on the hind-neck and upper portion of the back.

The immature female is duller in colour than the adult, and has the primaries, secondaries, and outer series of the greater wing-coverts broadly margined with pale buffy-white; tail-feathers brown with buffy-white margins, and passing into buff on the outermost feather, which has the outer web entirely buff except at the base.

In the south-eastern portions of the continent, immature birds only are obtained or observed after the main body of the migrants take their departure at the end of summer. Adult birds only were met with at Moree in November, some of the males having very narrow edges and tips of white to the secondaries; in others the primaries were externally edged and tipped with white, and the outer webs and tips of the secondaries broadly margined with white.

The breeding season in New South Wales usually commences at the end of September, and continues until the end of January or early part of February. Near Sydney the eggs are generally deposited during the first week in October, but I have found nests at Chatswood and Roseville, containing eggs, in the beginning of December. Owing probably to the drought in 1901, these birds were not so numerous as usual, and with their young had all left the district by the 31st December; the previous season they were noted as late as the 21st February. Dr. W. Macgillivray informs me that in the neighbourhood of Cloncurry, in Northern Queensland, they are very common, and nest everywhere immediately the wet season is over in January and February. From Point Cloates, North-western Australia, Mr. Tom Carter sends me the following note:—" *Lalage tricolor* is a winter visitor to this district. I found nests containing young on the 3rd August, 1899, and the 14th and 15th July, 1901."

The figure represents an adult male.

EXPLANATION OF PLATE B. II.

- Figs. 1, 2. *Ptilonorhynchus violaceus*.
Satin Bower-bird.
- Fig. 3. *Chlamydobera nuchalis*.
Great Bower-bird
- Figs. 4, 5, 6. *Chlamydobera maculata*.
Spotted Bower-bird.
- Fig. 7. *Chlamydobera guttata*.
Guttated Bower-bird.
- Fig. 8. *Chlamydobera cerviniventris*.
Fawn-breasted Bower-bird.
- Figs. 9, 10, 11, 12. *Chlamydobera orientalis*.
Eastern Bower-bird.
- Figs. 13, 14, 15, 16. *Sericulus melinus*.
Regent Bower-bird



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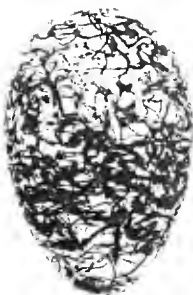
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EXPLANATION OF PLATE B. III.

- Figs. 1, 2, 7. *CRASPIDOPHORA ALBERTI*.
Prince Albert's Kille-bird.
- Figs. 3, 4, 5. *PHILOPHIS VICTORIAE*.
Queen Victoria's Kille-bird.
- Fig. 6. *PHONACIDIA COCCINEA*.
Australian Trumpet-bird.
- Figs. 8, 9. *PHILEMON CORNICULATUS*.
Friar-bird.
- Fig. 10. *PHILEMON BUCEROIDES*.
Helmeted Friar-bird.
- Figs. 11, 12. *GEOPHILA LUNULATA*.
Mountain Thrush.
- Figs. 13, 14, 15. *EDOLISOMA DENDROSTICH*.
Jardine's Caterpillar-eater.
- Figs. 16, 17, 18. *ORIOLUS SAGITTATUS*.
Olive-backed Oriole.
- Fig. 20. *ORIOLUS AFFINIS* (smaller race).
Northern Oriole.
- Fig. 19. *ORIOLUS FLAVICINCTUS*.
Yellow-bellied Oriole.
- Fig. 21. *ANTHOCHERA CARUNCULATA*.
Wattled Honey-eater.
- Figs. 22, 23. *PHILEMON CITREOGULARIS*.
Yellow-throated Friar-bird.
- Figs. 24, 25. *ANELLOBIA MELLIVORA*.
Brush Wattle-bird.



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EXPLANATION OF PLATE B-IV

- Figs. 1, 2, 3, 4, 5 — *COLLYRIOCINCLA HALMOPTERA*
Grey Shrike-Thrush
- Figs. 6, 7, 8. — *ODALICA CRISTATA*
Crested Bell-bird
- Figs. 9, 10 — *COLLYRIOCINCLA RECTIROSTRIS*
Straight-billed Shrike-Thrush
- Figs. 11, 12 — *SELCIRHODEUS CINEREUS*
Apostle-bird.
- Figs. 13, 14 — *PACHYCEPHALA OLIVACEA*
Olivaceous Thickhead
- Fig. 15 — *COLLYRIOCINCLA BRUNNEA*
Brown Shrike-Thrush.
- Fig. 16. — *COLLYRIOCINCLA RUFIVENTRIS*
Buff-bellied Shrike-Thrush
- Figs. 18, 19, 20 — *COLLYRIOCINCLA RUFOPECTUS*
Rufous-breasted Shrike-Thrush
- Figs. 23, 24, 25 — *COLLYRIOCINCLA PARVISSIMA* (short bill race)
Northern Rufous-breasted Shrike-Thrush
- Fig. 17 — *COLLYRIOCINCLA CLAVINIVENTRIS* (inland race)
Fawn-breasted Shrike-Thrush
- Figs. 21, 22 — *COLLYRIOCINCLA PARVULA*
Little Shrike-Thrush



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Family MUSCICAPIDÆ.

Genus RHIPIDURA, Vigors & Horsfield.

Rhipidura albiscapa.

WHITE-SHAFTED FANTAIL.

Rhipidura flabellifera (nec Gmel.), Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 247 (1826).*Rhipidura albiscapa*, Gould, Proc. Zool. Soc., 1840, p. 113; Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 310 (1879).

ADULT MALE—General colour above ashy-brown, slightly darker on the head; lesser wing-coverts ashy-brown; median and greater wing-coverts dark brown, with a spot of white on the tips of their outer webs; quills dark brown, the secondaries edged with white on their outer webs, two central tail-feathers blackish-brown, the remainder ashy-brown with a blackish-brown wash on their outer webs and tipped with white; shafts of the two central feathers blackish-brown, of the remainder and the outermost web of the outermost feather white; lores and sides of the face dull blackish-brown; a line over the eye, and one above the ear coverts white; cheeks and throat white; lower throat dull black; remainder of the under surface pale ochraceous-buff; sides of the breast ashy-brown; under tail coverts white; bill black, base of the lower mandible yellowish horn colour; legs and feet brownish-black; iris black. Total length in the flesh 6.25 inches, wing 3, tail 3 $\frac{1}{4}$, bill 0.28, tarsus 0.7.

ADULT FEMALE—Similar in plumage to the male.

Distribution—Queensland, New South Wales, Victoria, South Australia.

THE White-shafted Fantail is a common resident throughout the greater portion of Eastern and South-eastern Australia. Although found in the inland portions of the States, it is more frequently met with in open forest-lands and lightly timbered scrub near the coast. Favourite haunts also are humid mountain ranges and gullies. It is a lively and attractive species, and is usually met with in pairs, resorting sometimes to the topmost branches of the lofty *Eucalypti*, but just as often to saplings or low *Melaleuca* scrub within a few feet of the ground. It is also a close attendant on cultivation and is common about orchards and gardens, ridding the fruit trees and shrubs of many insect pests. Seldom does this active little bird remain still; it is almost constantly on the move, darting forth ever and anon to capture some passing insect, or fluttering slowly from tree to tree. During flight, and often when perched, it spreads the long feathers of its beautiful fan-shaped tail. When haunting orchards and gardens it becomes very tame, frequently warbling its low but sweet song while perched only a few feet away, or passing within arm's length of one, as they playfully chase each other from tree to tree. The song of this bird consists of a quickly uttered "chip chip," followed by a succession of clear and varied musical notes.

The food of the White-shafted Fantail consists of flies, moths, and small insects of all kinds, captured mostly while on the wing, also the larvae of various insects found on leaves and branches.

Some specimens obtained near Sydney, apparently very old birds, are dark smoky-grey above, and have the longer upper tail-coverts blackish-brown. The wing measurement of fully adult males varies from 2.8 inches to 3 inches.

The nest is an exceedingly neat and beautiful structure, resembling in form a wine-glass with the base or stand broken off close to the lower end of the stem. Usually it is formed of strips and shreds of the soft inner bark of trees, bound round and held together with spiders'

webs on the outside, and lined with bark fibre. Nests, however, from different localities, vary considerably in the materials from which they are constructed: in humid mountain gullies the foundations of some are formed of the soft downy reddish-brown covering of the newly budded fronds of tree-ferns, others are built chiefly of thistle-down, but, in all, the exterior is more or less thickly coated with spiders' webs. Occasionally the lining consists of very fine dried grasses or wiry rootlets. The tail, or appendage, below the nest is also of varying length and finish; in some I have seen long thin chips of wood or portions of leaves used instead of bark: it is not, too, always perfectly straight, for the nest is sometimes built over a nearly vertical branch, and the tail is constructed around it. A typical one, now before me, is formed of shreds and strips of the soft yellowish-white inner bark of trees, coated externally with spiders' webs, and is lined inside with very thin strips of bark and bark fibre. It measures two inches in external diameter, by a depth of four inches and a half, the nest proper measuring two inches, and the appendage below the thin three-pronged leafy branch on which it was placed two inches and a half; internal diameter of cup-like cavity one inch and three-quarters; depth one inch and a quarter. About Sydney thin dead twigs of gum saplings, tea-trees, and turpentine, are often selected as nesting-sites. Sometimes the nest is formed in a tall *Eucalyptus*, and, if the birds are unmolested, in any suitable tree about orchards and gardens. Generally it is built at the junction of a two or more pronged horizontal forked twig, but not infrequently in a nearly upright fork or on a drooping branch. It is placed at a height varying from three to forty feet from the ground, but on an average not over fifteen feet, and frequently within hand's reach.

The eggs are two or three in number for a sitting, and vary from oval to swollen oval in form, the shell being close-grained, dull, and lustreless. They vary in ground colour from dull white to creamy-white, some specimens being slightly darker on the larger end, and are minutely freckled, dotted, spotted, or irregularly blotched with yellowish-brown, or wood-brown, intermingled occasionally with a few underlying markings of a faint bluish-grey. As a rule the markings predominate on the thicker end, where they form a more or less well defined zone. In some specimens the markings are small and indistinct, and form a band of a slightly darker shade than the ground colour around the larger end of the shell; others have small clouded blotches unevenly distributed over the entire surface. A set of three, taken on the 13th October, 1901, at Roseville, measures as follows:—Length (A) 0.63×0.47 inches; (B) 0.62×0.47 inches; (C) 0.62×0.41 inches. A set of two, taken in the same locality, on the 22nd October, 1901, measures:—(A) 0.64×0.48 inches; (B) 0.65×0.49 inches. A set of two, taken at Chatswood, on the 10th November, 1901, measures:—(A) 0.6×0.51 ; (B) 0.61×0.5 inches. The nest from which these eggs were taken also contained an egg of the Square-tailed Cuckoo.

Fledgelings are ashy-brown above, with dull rufous edges to all the feathers, those on the crown of the head being of a clearer ashy-brown; wing-coverts ashy-brown, with white tips washed with rufous, as are also the margins and tips of the outer webs of the innermost secondaries; tail ashy-brown, the lateral feathers, except at the base, white; eye-brows rufous; on each side of the throat a narrow line of white feathers; cheeks, throat, and chest rufous-brown; remainder of the under surface dull white; bill blackish-brown; gape yellow; legs and feet fleshy-red; iris blackish-brown.

Young birds are duller in colour than the adults; the feathers on the sides of the nape, back, and rump are on the extremity tipped with rufous; median and greater wing-coverts dark-brown, tipped with rufous; the tips of the tail feathers are smaller and of a dull white; the white mark over the eye is more oval in shape, and the white mark above the ear-coverts in the adult is absent; chin dull white; upper throat ashy-brown; a band on the lower throat dull black; remainder of the under surface ochraceous-buff. Wing 2.8 inches.

On the morning of the 20th October, 1901, at Roseville, I disturbed from a nest built in a gum sapling, three young birds, two of which I captured, brought them into the Museum, photographed them as shown below, and returned them again to their anxious parents in the afternoon. Nine days after, I saw one of them being fed; it had grown almost as large as the parent, the dark band on the throat was clearly indicated, and the tail feathers were nearly as long as in the adult.

In the neighbourhood of Sydney, nidification usually commences early in September; the tail below the branch being first constructed, and the entire nest is generally finished in ten days; but when the birds have been just previously robbed of their eggs, it is built much quicker. The eggs are deposited on successive days; incubation, in which duty the male takes part, occupying twelve days; and the young birds leave the nest from ten to twelve days after being hatched. Two broods are reared during the breeding season, which generally terminates about the middle of January, but at Eastwood I saw several new nests just being started on 1st January, 1894. On the same day I saw a pair of these birds attending to the

wants of a young Square-tailed Cuckoo.

No species more readily forsakes its nest if disturbed while building, or clings more pertinaciously to it after the eggs are laid.



WHITE-SHAFTED FANTAILS (FLEDGELINGS).

On the 24th September, 1898, at Roseville, I found a nest built on a thin horizontal branch of a gum sapling, about eight feet from the ground, and saw one of the birds sitting on it. A companion who was with me climbed the tree, and before I could warn him, put the tip of his finger inside the nest which was just finished. On visiting it ten days later we saw the birds removing it to the topmost twigs of a sapling, about forty yards away, and to a height of twenty-five feet from the ground. This nest was examined on the

16th October, with a similar result, portion of it being removed three days later, the tail alone being left at the end of a week. The nests, however, are not removed by the birds as a rule, although they are often deserted if one only too closely examines them.

The following instance will illustrate the tenacity with which this species clings to its nest after the eggs are deposited. On the 29th October, 1898, Mr. C. G. Johnston and myself visited a nest we had found nearly finished the previous week, in a tall gum sapling on the side of a gully at Chatswood. On nearing the tree we saw one of the birds fly up to the nest and relieve its mate who was sitting. After awaiting for a few minutes, my companion climbed the lower limbs of the tree, but the occupant of the nest did not move. Reaching the nest he tried to frighten it off by waving his hands, but it would not budge, and all attempts to dislodge it with a thin stick were of no avail. He then tried to lift it off, but the bird clung with its feet to the lining of the structure. Finally slipping his fingers down to the bird's claws, he gently detached them from the sides of the nest, and placed the bird in his coat-pocket while he took the eggs. This was by no means an easy feat, for he could just manage to reach the nest as it was built on a very thin terminal twig, and a gale was blowing at the time. After descending from the tree and examining the eggs, which proved to be two of the White-shafted Fantail and one of the Square-tailed Cuckoo (*Cacomantis variolosus*), he lifted the bird out of his pocket. It did not exhibit the slightest fear or struggle to get free while we examined it. Directly it was restored to liberty, it flew to a neighbouring branch and started to preen its feathers, and

then again took possession of the nest. Another Fantail whose nest was found the same afternoon, did not exhibit the same fearless disposition, but forsook its charge immediately my companion commenced to climb the tree. Both of these nests were about fifteen feet from the ground, and each contained an egg of the Square-tailed Cuckoo. On the 8th December, 1898, we found a White-shafted Fantail sitting on its nest in a low gum sapling at Roseville. Attempts to frighten or dislodge it with a Grass-tree stem were unsuccessful, but it abandoned the nest directly we essayed to hit it off. The nest, which the Fantails afterwards deserted, only contained an egg of the Square-tailed Cuckoo.

A nest I found at Roseville, on the 13th October, 1901, was built on a thin dead twig of a Smooth-barked Apple-tree (*Eugenia lanceolata*), about four feet from the ground, and contained three partially incubated eggs. These I removed, and concealed under some fallen leaves of a *Casuarina suberosa*. On returning next day to photograph the nest, I observed the same pair of birds busily engaged in carrying nesting material into an adjoining paddock. Following them up, I found about sixty yards away they had already formed—under the junction of several thin leafy twigs of a Turpentine (*Synedra myrtilata*), at a height of four feet from the ground, the tail or stem-like appendage of a new nest. Passing the structure two days later, I found half of the cup formed; and on the 22nd October, or ten days later, since removing the eggs from the first nest, I found the second one completed, and the female sitting on two fresh eggs. Of six nests I found that season, five contained either three eggs or three young ones.

When the young ones are about half-fledged, and their bills are visible over the edge of the nest, the rim of the hitherto neat structure loses that rounded appearance, and becomes much frayed, and is greatly bulged and flattened out as the young continue to grow. A nest I had under daily observation at Roseville, about seven feet from the ground, built in a Forest Oak (*Casuarina suberosa*), on my visiting it on the 8th November, 1901, contained three young ones standing on a shapeless mass of nesting material. On my venturing beneath it, two of them fluttered away from the remains of what was once a perfect and beautiful home.

Rhipidura preissi.

PREISS'S FANTAIL.

Rhipidura preissi, Cabanis, Mus. Hein., Theil. I., p. 57 (1859); Gould, Handbk. Bds. Austr., Vol. I., p. 240 (1865); Sharpe, Proc. Zool. Soc., 1881, p. 387.

ADULT MALE—*Similar to the adult male of R. albiscapa, but having the upper parts with a slightly more ashy-grey shade, the under surface of a lighter ochraceous-buff, and no black band on the lower throat, which is ashy-brown tinged with grey, like the sides of the breast. Total length 5·8 inches, wing 3, tail 3·4, bill 0·3, tarsus 0·1.*

ADULT FEMALE—*Similar in plumage to the adult male.*

Distribution.—Western and North western Australia.

PREISS'S FANTAIL is the representative of *R. albiscapa* in Western and North-western Australia. While collecting on behalf of the Trustees of the Australian Museum, Mr. George Masters, the present Curator of the Macleay Museum, obtained adults and young at King George's Sound, in March, 1866; and again, in the same locality, in November, 1868. Its haunts and habits, Mr. Masters informs me, are precisely similar to those of *R. albiscapa*.

From Point Cloates, North-western Australia, Mr. Tom Carter writes me, as follows:—" *Rhipidura preissi*, is mostly a winter visitor here, and some years is quite numerous, arriving about the end of May or June. It is common in the mangroves, where there is an abundance of insects, and I have often noticed it on the beach feeding upon small flies that abound on strips of seaweed left by the receding tide. This species is very tame and confiding."

A nest in the Australian Museum collection, taken at King George's Sound by Mr. Masters on the 7th October, 1868, is indistinguishable from that of its eastern representative: so also are two of its eggs, taken in South-western Australia in October, 1899. The latter measure:—Length (A) 0·62 × 0·47 inches; (B) 0·6 × 0·5 inches.

Young birds resemble the adults, but have the upper wing-coverts more broadly tipped with white; under surface more strongly washed with ochraceous-buff, and only a slight indication of the ashy-brown band on the lower throat. Wing 2·7 inches.

Rhipidura diemenensis.

TASMANIAN FANTAIL.

Rhipidura saturata, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 311 (1879).

Rhipidura diemenensis, Sharpe, Ibis, 1879, p. 368.

ADULT MALE—Differs from the adult male of *R. albiscapa* in having the upper parts of a slightly deeper brown shade, the tail feathers darker and having smaller and duller white tips, the black band on the lower throat narrower, and the remainder of the under surface of a slightly deeper shade of ochraceous-buff. Total length 5·5 inches, wing 2·9, tail 3·4, bill 0·28, tarsus 0·68.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Tasmania, and some of the islands of Bass Strait.

THE Tasmanian Fantail is another close ally of the continental species *R. albiscapa*. Specimens in the Australian Museum collection were obtained by Mr. George Masters at the Ouse River and Mount Wellington, in April and March, 1867. Examples in the flesh have also recently been received from Mr. E. D. Atkinson, of Waratah, Mount Bischoff, in the North-western portion of the island. From notes received from Mr. Atkinson I have extracted the following information:—"These little birds are widely distributed over Tasmania, except on the plain country, and are also found on Flinder's, Barren, and West Hunter's Islands. Generally they are seen in pairs, more especially in the vicinity of water-courses, and in this district frequently in the depths of the gloomy forest. They are constantly on the move, and in a most irregular flight dart about in all directions in pursuit of small insects, which constitute their food. The nest, which resembles a wine-glass in shape, is formed of shreds of bark bound round with spiders' webs, and lined inside with glossy brown down gathered from the fronds of the tree-fern. It is placed on a thin horizontal twig, or in a partially upright fork, and those I found were by observing the head and tail of the sitting bird projecting over the sides of the nest."

The following information is extracted from Dr. Lonsdale Holden's MS. notes, made on the North-western coast of Tasmania:—"I found an unfinished nest of *Rhipidura diemenensis*, attached to the horizontal twigs of a tea-tree branch, in a swamp on Circular Head Peninsula, on the 8th November, 1886. It was cup-shaped, and built of strips of fine whitish soft inner bark, covered externally with cobwebs, and had a kind of tail or projection underneath the nest like the broken stem of a wine-glass. Three days later I saw one of these birds building a nest in a tea-tree swamp close to Stanley. On the 14th November I found another nest nearly ready for eggs, in a tea-tree in the township paddock, Circular Head; it was about five and a half feet from the ground. I took two eggs from this nest on the 20th November. Two days later I visited the nest found on the 11th November, and found the bird sitting on three eggs. On the 30th November, at Brickmakers' Bay, I found a nest with three eggs, and another with two, both sets being very much incubated. Perhaps the latter had lost an egg, for it was built on a bit of loose dead branch, lying in a tea-tree, and was very much on one side when I found it. Next day I found another nest in tea-tree scrub near Stanley, in which the bird was sitting on two fresh eggs. In diameter the most perfect of these nests measures externally two inches

and a quarter; length, including dependent tail, four inches; internally one inch and two-thirds in diameter by one inch and a quarter in depth. These birds are as plentiful and as tame in winter as in summer."

Eggs two or three in number for a sitting: oval or rounded oval in form, the shell being close grained, dull and lustreless. The ground colour, which varies from dull to creamy-white, is freckled or blotched with pale or creamy-brown, particularly on the larger end, where in some specimens they are intermingled with underlying markings of dull bluish-grey. The same variation in colour and distribution of their markings is to be found in the eggs of this species as in those of *R. albiscapa*, from which they cannot be distinguished. A set of three measures: Length (A) 0.64×0.45 inches; (B) 0.65×0.45 inches; (C) 0.65×0.46 inches. A set of two measures: Length (A) 0.61×0.47 inches; (B) 0.6×0.47 inches.

Rhipidura albicauda.

WHITE-TAILED FANTAIL

Rhipidura albicauda, North, Hib., 1895, p. 340; *ib.*, Rep. Horn Sci. Exped. Central Austr., Pt. II, Zool., p. 75, pl. 6, lower fig., (1896).

ADULT MALE—General colour above ashy brown, becoming slightly darker on the head and browner on the rump and upper tail-coverts; lesser wing-coverts ashy-brown, the median and greater series dark brown, the former narrowly, and the latter largely, tipped with white; quills dusky brown, the innermost secondaries margined with white on their outer webs; two central tail feathers blackish-brown, the two outermost feathers on either side pure white, the remainder white, narrowly edged with blackish-brown on the basal half of their outer webs, which increases in extent towards the two central feathers; lores and ear-coverts blackish-brown; a line above the eye, and a shorter one above the ear-coverts, white; cheeks and throat white; lower throat dull black; remainder of the under surface light ochraceous-buff; sides of the breast pale ashy-brown; under tail-coverts white; bill black; legs and feet brownish-black; iris black. Total length 5.8 inches, wing 2.8, tail 3.5, bill 0.55, tarsus 0.65.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Central Australia.

THIS species, which differs from *R. albiscapa* in having all but the two central tail feathers pure white, was one of the novelties secured by the members of the Horn Scientific Expedition in Central Australia in 1894. Mr. G. A. Kearland writes me that "it haunts the mulga scrubs of the Levi Range, where specimens were obtained, and others were shot at Petermann and Adminga Creeks; it is also fairly plentiful near Ilamurta. In note, and habit of fluttering from branch to branch, it closely resembled *R. albiscapa*, but when its glossy-white outer tail feathers on either side of the dark centre were displayed, the difference was at once very conspicuous, more especially when the sun was shining through them, making each feather appear as if it was made of white satin."

The small cobweb coated and delicately formed open nest of this species doubtless closely resembles that of its well-known near ally the White-shafted Fantail, for Mr. C. E. Cowle who found one at Ilamurta in December, 1894, in describing it to Mr. Kearland, states it is of a "pipe-like shape," evidently referring to the tail-like appendage below the nest, and the thin mulga branch on which it was placed. The single egg, however, which it contained, varies somewhat from typical eggs of the White-shafted Fantail. It is oval in form and of a faint buffy-white ground colour, which is thickly covered with minute and indistinct freckles of pale purplish-buff, the markings being most thickly disposed on the larger end and thus forming an obscure cap. Length:— 0.65×0.5 inches. Another egg subsequently received by Mr. Kearland, is indistinguishable from the ordinary zoned type of egg of *R. albiscapa*.

Rhipidura rufifrons.

RUFOUS-FRONTED FANTAIL.

Muscicapa rufifrons, Lath., Ind. Orn., Suppl., p. 1., (1801).

Rhipidura rufifrons, Gould, Bds. Austr., fol., Vol. II., pl. 84 (1848), (part); *id.*, Handbk. Bds. Austr., Vol. I., p. 240 (1865).

ADULT MALE—Crown of the head, neck, mantle, and upper portion of the back brown slightly tinged with pale orange-rufous; lower portion of the back, rump, and upper tail-coverts orange-rufous; upper wing-coverts and quills brown, tinged with pale orange-rufous, which is more distinct on the outer webs of the inner secondaries; base of the tail-feathers orange-rufous, the terminal half blackish-brown, with pale brown tips; forehead, and a line of feathers above the eye orange-rufous; ear-coverts dark brown; chin, cheeks, upper portion of the throat, and a broad line of feathers extending on to the sides of the neck white; lower throat black; feathers of the fore-neck and chest black margined with white; centre of the breast dull white; sides of the breast and abdomen fawn colour; under tail-coverts fawn-buff; bill brown, base of lower mandible yellowish-horn colour; legs and feet brown; iris brown. Total length in the flesh 6·2 inches, wing 2·9, tail 3·5, bill 0·55, tarsus 0·75.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Queensland, New South Wales, and Victoria.



RUFOUS-FRONTED FANTAIL.

THE Rufous-fronted Fantail is found in favourable situations throughout the greater portions of Eastern Queensland, Eastern New South Wales, and Victoria. This species chiefly frequents humid mountain ranges and the rich coastal brushes during spring and summer, leaving after the breeding season is over early in autumn, for more open parts of the country. It is of the same restless disposition as its smaller congener *R. albiscapa*, and is constantly on the move, displaying the rich colour of the lengthened feathers of its fan-shaped tail. It is more often met with singly, except in the breeding season, when it is

generally seen in pairs, frequenting the trees near the water in mountain gullies, or the margins of creeks and rivers in the brushes. Sometimes it is seen in the centres of large cities. Mr. George Masters, Curator of the Macleay Museum at the Sydney University, informs me that while engaged in entomological duties at his table near a window one day, one of these birds found its way into the building. After flying several times backwards and forwards the length of the Museum, it finally selected as a resting place the top of his head, and there it remained for some time until he attempted to put his hand near it.

Although found close to or in Sydney in autumn and winter, I have only known it to breed in the gullies on the highlands of the Milson's Point railway-line, beyond Chatswood and Roseville, or in the humid scrubs and gullies at National Park and Waterfall.

The food of this species consists entirely of small insects, flies, small moths, etc., captured principally while on the wing. Unlike the White-shafted Fantail, which frequently builds its nest in fruit trees, it is seldom seen in orchards during the breeding season, unless contiguous to its usual haunts.

The nest, like that of *R. albiscapa*, resembles in shape a wine-glass with the base broken off at the lower end of the stem, but it is somewhat larger and made of coarser material. Usually it is composed of shreds of bark, bound round and held together with cobwebs, the inside being lined with black hair-like rootlets, dried grasses, or the fruiting stalks of mosses, the tail-like appendage below the nest proper being of varying length and sometimes entirely absent. An average nest measures externally two inches and a half in diameter by two inches in depth, internally two inches in diameter by one inch in depth, the tail-like appendage below the nest measuring three inches and a half.

A nest received from Mr. J. Gabriel, and taken at Bayswater, Victoria, is built on the midrib of a fern frond, and is securely held in position by the nesting material being worked over the pinnae at each side. It is cup-shaped in form, and lacks the usual tail-like appendage, the width of the frond probably precluding the birds from constructing it. The nest is formed of the soft yellowish-white inner bark of trees, bound round with cobwebs, the outside being lined with very fine dried grasses, a small quantity of bright orange-red fruit and fruit-stalks of mosses. Four other nests, taken in the same locality, are built at the junction of several thin leafy branchlets near the end of partially upright or drooping branches, the tail-like appendage of one nest being woven around a thin perpendicular twig beneath the nest. With the above nests, Mr. Gabriel has kindly sent the following notes:—"The Rufous-fronted Fantail, as a rule, builds over or near water in the fern gullies, but I have found them well up the creek banks. The nests are cunningly placed, and easily overlooked, but at Bayswater the birds shew a decided preference for the Hazel (*Pomaderris apetala*), and the Blanket-tree (*Senecio bedfordi*). As far as my experience goes, December and January are the usual breeding months, but I have found several nests with young in December, and have a set of eggs in my possession that were quite fresh when taken on the 1st February, 1896. A friend of mine found a nest only a foot above the surface of the water, and I have taken them in hazel trees at a height of twenty feet from the ground."

A nest of this species in the Australian Museum collection, found on the 16th January, 1897, by Mr. S. W. Moore and his son at the Valley of Waters, in the Blue Mountains, New South Wales, was built in a Coach-wood (*Crystapetalum apetalum*) growing on the steep bank of a creek, about ten yards from the water. It contained two fresh eggs that were visible when standing on the shelving ground above the tree in which the nest was built. Mr. Moore found the nest of the same pair of birds ten days after, not far from the site of the previous one, containing two fresh eggs. It was built in a tree about four feet from the ground, and was partially hidden by a large boulder. At Waterfall, on the 2nd January, 1899, Mr. Moore found an unfinished nest in a Coach-wood, on the bank of a creek close to where we were having our lunch. It was built near the leafy extremity of a thin branch about a foot from the ground, and was rendered more difficult of detection by the lower branches of the tree being covered in places with *debris*, while the creek had been previously in flood. Ten days later Mr. L. Moore visited it and found it completed, with one egg in the nest, and another lying broken beneath it.

The nests are usually built at the junction of a one or more pronged horizontal leafy branch, sometimes against or in a thin upright fork, and in the rich coastal brushes not infrequently on a vine. Generally they are low down and within hand's reach, sometimes within a foot of the ground, the height varying up to twenty feet. The nests I have found in New South Wales were, as a rule, built in large-leaved trees. Although the present species is usually more cautious than the White-shafted Fantail, like that species it is a close sitter when one approaches near the nest.

The nest figured I found on the 11th November, 1901, at Ourimbah, when about two-thirds built. It was placed on the thin stem of a tree under a creek bank. On the 23rd

November, I disturbed the female while sitting on her egg and an egg of the Square-tailed Cuckoo, the latter being the larger of the two eggs figured. Both eggs were partially incubated, and she was very reluctant to leave them. The cup-like cavity of this nest is slightly shallower, and the tail-like appendage below the structure longer than usual. Externally it measures five inches and a quarter in length, by two inches and a quarter in diameter; and the inner cup one inch and three-quarters in diameter by seven-eighths of an inch in depth. The ragged end of the lower part of the structure consists principally of long chips of soft decaying wood, some of them measuring one inch and a half in length by nearly a quarter of an inch in width.

The eggs are two in number for a sitting, and vary in form from oval to rounded oval, some specimens being rather pointed at the smaller end; the shell is close-grained, and its



NEST OF RUFOUS FRONTED FANTAIL.

surface smooth and slightly lustrous. They vary in ground colour from a very pale cream or yellowish-white, to a rich cream, and are usually minutely dotted and spotted on the larger end with yellowish-brown, rich umber-brown, or dull reddish-brown, intermingled, as a rule, with a few small underlying spots of dull bluish-grey, and there forming a well-defined zone. In some specimens there are no underlying markings, and the spots are evenly distributed around the larger end of the shell; others have there a yellowish-brown band, which is minutely dotted and spotted with richer shades of brown. In most specimens the smaller end is entirely devoid of markings, or has only a few widely distributed spots. A set of two, taken on the 19th September, 1897, in the Richmond River District, measures as follows:—Length (A) 0.65×0.51 inches; (B) 0.62×0.51 inches. A set of two, taken at Bayswater, Victoria, measures:—(A) 0.65×0.49 inches; (B) 0.68×0.49 inches. Two eggs, taken at Ourimbah from different nests, measure:—(A) 0.7×0.53 inches; (B) 0.72×0.49 inches.

Young birds resemble the adults, but have the upper portion of the back, scapulars, and upper wing-coverts strongly washed with orange-rufous; forehead, a line above the eye

extending on to the sides of the nape, pale orange-rufous; fore-neck dull ashy-brown; chin and remainder of the under surface dull brownish-white, washed with pale rufous, the feathers on the lower throat having blackish-brown centres; sides of the body and under tail-coverts fawn colour. Wing 2.7 inches.

In Southern Queensland and the northern coastal brushes of New South Wales, nests with eggs have been found early in September, and generally throughout October and November. About the mountainous gullies a little distance to the north and south of Sydney, November and the three following months constitute the usual breeding season. On the Blue Mountains, nests have been found with eggs early in November, and as late as the end of January. It is evident that two or more broods are reared during the season, for at Ourimbah, on

the 27th December, 1902, I observed a female building in the next tree to the one from which the nest and eggs figured were taken the previous year, the tail-like appendage and base of the structure alone being formed. A little lower down the creek, and a few yards away from the opposite bank, was a completed nest containing a single fresh egg. On another creek I found a nest built in a tree overhanging the water, and in it two nearly fledged young. This nest was about two feet from the surface of the water, and was devoid of the usual tail-like termination beneath the structure.

As I have previously pointed out, the Rufous-fronted Fantail is one of the foster-parents of the Square-tailed Cuckoo. I found a nest at Ourimbah, on the 24th November, 1899, in a low tree about twenty yards from a creek, on which the female was sitting, containing a young Square-tailed Cuckoo; beneath the nest, which was four feet from the ground, I found a perfect egg of *Rhipidura rufifrons*, with the yolk dried hard up in it.

Rhipidura intermedia.

ALLIED FANTAIL.

Rhipidura intermedia, North, Vict. Nat., Vol. XIX., p. 101 (1902).

ADULT MALE—Like the adult male of *RHIPIDURA RUFIFRONS*, but distinguished from that species by the less extent of orange-rufous on the basal half of the tail-feathers, the terminal half being blackish-brown, and distinctly tipped with white; by the narrower black band on the lower throat, the less scale-like appearance of the feathers on the fore-neck, and the centre of the breast and abdomen being white, the latter washed on the sides with pale fawn-buff; sides of the breast ashy-brown; under tail coverts pale fawn colour; bill dark brown, yellowish horn colour at the base of the lower mandible; legs and feet brown. Total length 5.4 inches, wing 2.9, tail 3.3, bill 0.32; tarsus 0.7.

ADULT FEMALE—Similar in plumage to the male.

Distribution. North-eastern Queensland.

THE present species is an inhabitant of the scrubs of the Bellenden Ker and Sea-view Ranges in North-eastern Queensland. I have never seen it from any other part of that State, but doubtless its range extends throughout the entire belt of rich tropical vegetation found in the central portion of the coastal districts of North-eastern Queensland, lying between Cardwell and the Endeavour River. It cannot be strictly regarded as the northern representative of *R. rufifrons*, for during the "Chevert" Expedition, in 1875, Mr. George Masters obtained typical examples of that species at Cape York.

Dr. Sharpe's description of *Rhipidura rufifrons*, in the "Catalogue of Birds in the British Museum," evidently applies to this species, for he describes the tail feathers as being "distinctly tipped with white." The type of *R. rufifrons*, characterised by Dr. Latham, was obtained in New South Wales, and has the tips of the tail feathers pale brown, not white. In the latter respect *R. intermedia* agrees with *R. torrida*, described and figured† by Dr. Alfred Russel Wallace, from the island of Ternate, but *R. torrida* differs from *R. intermedia* in having the ear-coverts and upper breast black.

Many specimens of *Rhipidura intermedia* were obtained by Messrs. Cairn and Grant while collecting on behalf of the Trustees of the Australian Museum, in North-eastern Queensland, from the vicinity of Cairns, and upon the highest peaks of the Bellenden Ker Range.

The eggs are indistinguishable from those of its ally *R. rufifrons*, being oval in form, of a pale cream ground colour, and slightly darker at the larger end, where they are dotted and spotted with dull umber-brown, intermingled with a few underlying spots of faint bluish-grey. A set of two measures:—Length (A) 0.69 × 0.52 inches: (B) 0.68 × 0.49 inches.

* Cat. Bds. Brit. Mus., Vol. iv., p. 319 (1879).

† Proc. Zool. Soc., 1865, p. 477.

Rhipidura dryas.

WOOD FANTAIL.

Rhipidura dryas. Gould, Bds. Austr., fol., Vol. I., Introd., p. xxxix. (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 242 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 322 (1879).

ADULT MALE—*Resembles the adult male of R. rufifrons, but is principally distinguished from that species by having the tail feathers largely tipped with white and being rufous at the base only; forehead, rump, and upper tail-coverts rufous; chin, upper throat, and sides of the neck white; lower throat black; remainder of the under surface dull white tinged with fulvous; sides of the body and under tail-coverts pale fulvous; bill dark brown; legs and feet brown. Total length 6 inches, wing 2.7, tail 3.4, tarsus 0.75.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Northern Territory of South Australia; Gulf District, Queensland.

THE type of this species was obtained at Port Essington. Examples were secured by Mr. Alex. Morton and the late Mr. E. Spalding at Port Darwin; and both Mr. Gulliver and Mr. K. Broadbent obtained specimens at the Norman River, in Northern Queensland.

An egg taken during January, 1902, near the Daly River, in the Northern Territory of South Australia, is a short oval in form, the shell being close-grained, smooth, and slightly lustrous. It is of a dull yellowish white ground colour, with an indistinct zone of confluent spots and blotches of dark yellowish-brown and bluish-grey around the thicker end. Length:—0.65 × 0.52 inches. Another egg, taken at Port Darwin, is oval in form and of a creamy-white ground colour, slightly darker at the larger end, where there is an irregular zone of spots and small blotches of umber-brown, intermingled with a few underlying spots of dark bluish-grey. Length:—0.65 × 0.47 inches. The latter egg is indistinguishable from that of its southern congener *R. rufifrons*.

Rhipidura isura.

NORTHERN FANTAIL.

Rhipidura isura, Gould, Proc. Zool. Soc., 1840, p. 174; *id.*, Bds. Austr., fol., Vol. II., pl. 85 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 242 (1865).

ADULT MALE—*General colour above dark greyish-brown; upper wing-coverts and quills brown, the secondaries narrowly edged externally with ashy-grey; tail dark brown, the two central feathers with a blackish wash; the outer web of the outermost feather and a broad tip white, the next on either side with a long oval spot of white at the tip; head and ear-coverts blackish; chin and throat white; a broad band across the chest greyish-brown, narrower in the centre, some of the feathers with dull white shaft streaks; remainder of the under surface pale buffy-white; under tail coverts white; bill black; legs and feet black; iris black. Total length 6.5 inches, wing 3.4, tail 3.4, bill 0.5, tarsus 0.6.*

ADULT FEMALE—*Similar in plumage to the adult male.*

Distribution.—North-western Australia, Northern Territory of South Australia, North-eastern Queensland.

THIS species, which is so markedly different in colour, and cannot be confused with any other member of the genus inhabiting Australia, is distributed over the Northern, North-eastern, and North-western portions of the continent. Mr. Kendal Broadbent obtained adults and young in the scrubs near Cardwell in 1877; Messrs. Cairn and Grant procured examples near Boar Pocket on the table-lands of the Bellenden Ker Range, in 1888; Mr. A. Morton obtained adults, and the nest and eggs at Port Essington in 1879; and Mr. E. J. Cairn procured adults and young at Derby, North-western-Australia, in 1886. In the same

locality, the late Mr. T. H. Bowyer-Bower obtained adult specimens, also the nest and eggs, in October, 1886.

In the more flattened and broader bill, and the squarer form of its tail feathers, this species differs somewhat from the typical members of the genus *Rhipidura*. All the adult specimens I have examined agree with Gould's original description in having the three outer tail feathers tipped with white. Dr. Sharpe, in describing *Rhipidura setosa* in the "Catalogue of Birds in the British Museum," of which he ranks the present species, *R. isura*, as a synonym, writes:—"tail blackish, the penultimate feather slightly tipped with white, often absent, the outermost feather broadly tipped with white."

Mr. Grant informs me that in habits this species resembles the Black and White Fantail (*Sauloprocta melaleuca*), keeping to the more open parts, or margins of the scrubs, and never being met with in the dense brush. The stomachs of those specimens he examined contained various kinds of insects and their larvæ.

A nest of this species in the Australian Museum, taken near Port Darwin, in 1879, is similar to that of *R. albiceps*, but is slightly larger and not so compactly formed. It is composed entirely of very thin strips of bark woven together with spider's web, and has no special lining. The nest is built at the junction of a fine three-pronged branch and the stem-like appendage at the bottom of it is worked around a twig growing below the fork on which it is placed. It measures externally two inches and a quarter in diameter, by two inches in depth; the inner cup one inch and a quarter in diameter by one inch in depth; and the tail-like appendage below the nest proper one inch and a half.

The eggs are two in number for a sitting, and can hardly be distinguished from those of small eggs of *Sauloprocta melaleuca*. They are oval in form, the shell being close-grained, smooth, and almost lustreless. The ground colour is a pale creamy-white, being slightly richer on the larger end, where there is a well defined zone of dull wood-brown spots, intermingled with a few small and indistinct underlying dots of pale bluish-grey. Length:—(A) 0.7 × 0.58 inches; (B) 0.71 × 0.57 inches. Another set of two, taken near Cardwell, North-eastern Queensland, measures: (A) 0.7 × 0.55 inches; (B) 0.69 × 0.55 inches.

Young birds resemble the adults, but have the primary coverts and secondaries tipped with buff, and the tips of the greater wing-coverts with buffy-white; over the eye a short white streak; the throat washed with buff; the greyish-brown band on the chest not so distinct; and the remainder of the under surface buff. Wing 3.2 inches.

October and the three following months constitute the breeding season of this species.

Genus SAULOPROCTA, *Cabanis*.

Sauloprocta melaleuca.

BLACK AND WHITE FANTAIL.

Muscicapa tricolor, Vieill., Nouv. Dict. d'Hist. Nat., tom. XXI., p. 430 (1818).

Muscipeta melaleuca, Quoy et Gaim., Voy. de l'Astrol., Zool., tom. I., p. 180 (1830).

Rhipidura motacilloides, Vig. and Horsf., Trans. Linn. Soc., Vol. XV., p. 248 (1826); Gould, Bds. Austr., fol., Vol. II., pl. 86 (1848).

Sauloprocta motacilloides, Gould, Handbk. Bds. Austr., Vol. I., p. 244 (1865).

Rhipidura tricolor, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 339 (1879).

Sauloprocta melaleuca, Salvad., Orn. Pap. et Molucc., Pt. II., p. 48 (1881).

* Cat. Bds. Brit. Mus., Vol. iv., p. 329 (1879).

ADULT MALE—General colour above black; lesser and median upper wing-coverts like the back, the greater coverts and inner secondaries blackish brown; quills brown; tail black; over the eye a narrow white line; sides of the head, chin, throat, and sides of the breast black; some of the feathers of the throat narrowly tipped with white; remainder of the under surface white; bill black; legs and feet black; iris black. Total length in the flesh 8 inches, wing $\frac{1}{2}$, tail $\frac{1}{2}$, bill 0.52, tarsus 1.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Northern Territory of South Australia, Queensland, New South Wales, Victoria, South Australia, Western and North-western Australia, Central Australia, Moluccas, Aru Islands, New Guinea, New Britain, New Ireland.

ALTHOUGH differing but slightly in external characters, the terrestrial habits of this familiar and well known species are the reverse of those of the members of the genus *Rhipidura*, who pass most of their time among the branches of trees. Count Salvadori,* who has examined the types of the birds described under the three previously quoted names, regards them as alike, but discards Vieillot's older specific name of *tricolor* in favour of the appropriate one of *melaleuca* of Quoy and Gaimard, as the former tends to give a false impression of its characters. The specific name of *tricolor* is certainly a misnomer, and becomes more apparent when associated with the vernacular name of "Black and White Fantail," which is commonly applied to this species.

It is distributed over nearly the whole of the Australian continent, and is also found in the Moluccas, Aru Islands, New Guinea, New Britain, and New Ireland.

The white line above the eye is broader and more distinct in some specimens than others; there is, too, a variation in size of adult birds procured even in the same district. The average wing measurement of a number of adult males, obtained in the neighbourhood of Sydney, is $\frac{1}{2}$ inches, but it varies from 3.85 inches to $\frac{1}{2}$ inches. A semi-adult male is indistinguishable in colour and size from one obtained in New Guinea, the wing measurement being alike 3.8 inches. The wing measurement of two adult males from the Solomon Islands measure respectively $\frac{1}{2}$ and $\frac{1}{2}$ inches; these birds, however, can easily be distinguished from Australian examples by the conspicuous broader white line above the eye and their larger and more robust bills. *Sauloprocta picata*, Gould, from Northern and North-western Australia, appears at most to be only a slightly smaller race of the present species.

The Black and White Fantail is a permanent resident, frequenting chiefly open forest lands, the timbered margins of rivers and creeks, and to a less extent the belts of timber on the open plains. Its partiality for the companionship of man has made it a general favourite, and it is encouraged, protected, and welcomed everywhere, haunting alike farms and orchards, and the public parks and gardens of cities. Seldom more than a pair are seen together, except when the adults are accompanied by their young. It is of a restless disposition, and from its habit of swaying its fan-shaped tail from side to side is known in many parts of Australia by the name of "Wagtail."

The call-notes resemble the sounds of the words "sweet pretty creature," and frequently they are uttered on bright moonlight nights, especially during spring and summer. Those of alarm are like the noise made by a child's wooden spring-rattle.

The greater portion of its food is secured upon grass lands, frequently hopping just in front of cattle and horses and catching the insects disturbed by them while feeding, principally flies, small moths, and beetles. I have also seen it eat worms, and pick up bread-crumbs about houses. Like all the Flycatchers, this bird has the habit of watching the insects flying around it while perched on a limb of a tree, or top of a post or fence. Suddenly it darts into

* Orn. Pap. et Molucc., Pt. ii., p. 48 (1881).

the air, and with a vicious little snap secures its prey, returning again to the same place to pull it to pieces and eat it. Mr. Frank Hislop informs me that he has frequently seen this species feasting on ticks infesting cattle, in the Bloomfield River District, North-eastern Queensland. So tame do these birds become, if unmolested about country houses, that they will feed out of their protector's hands. From the Reed-beds, near Adelaide, Mr. W. White writes me:—"There is a pair of *Sauloprocta motacilloides* been about here for several years. They nest in a tree close to my house, and have two broods of three or four every season. If I call them, they are so tame that they will fly down and perch on my finger and feast on any dainty I have for them in the palm of my hand. They have a great liking to rest on the toe of my boot while I am sitting down." While in the garden at "Holmfirth," adjoining the residence of Mr. White, Mr. J. H. Mellor pointed out to me the young of a pair of birds that used to feed out of his hands. Both Mr. White and Mr. Mellor have encouraged and protected the native birds for many years, and their estates are secure havens and breeding-grounds for many species.

The nest is a round cup-shaped structure, outwardly formed of fine strips or shreds of bark, woven and held together with cobwebs, the rim and exterior portion of the nest being thickly coated with cobwebs, making it resemble an excrescence of the tree: inside it is neatly lined with fibrous roots, and sometimes with horse-hair or cow-hair. An average nest measures externally three inches in diameter, by two inches and a half in depth: internally two inches and a quarter by one inch and a quarter in depth. Usually it is built on a horizontal branch, or at the junction of one or more thin forked branches, and frequently on one overhanging water. I have also seen it built on fallen branches, and on rare occasions in high trees a considerable distance from any stream. Preference is given for smooth-barked trees as nesting sites, and mostly for gums or wattles. A favourite situation is in a willow-tree overhanging a river, pond, or ornamental sheet of water, also in fruit-trees. Nests are often built on the foundation of the old ones of previous seasons, or are placed close to an old one. The average height at which they are built is from eight to twenty feet, but I have found them as low as three feet, and in rare instances as high as forty feet. Curious nesting-sites are sometimes selected; one nest I saw was built on a bare flat plank which extended over a water-hole out on a plain: another, in the South Australian Museum, Adelaide, is built in a loop of thick rope: and in the same institution is one built at the junction of two crossed fencing-wires. The late Mr. K. H. Bennett also took the eggs of this species at Yandembah, from a nest constructed of wool and built inside the deserted nest of a Magpie-Lark. I have on several occasions found the nest of the Black and White Fantail in the same tree as the nest of the Magpie-Lark. Recently I saw occupied nests of both species in a tree on a vacant block of land in one of the principal streets of Chatswood.

From Adelaide, Dr. A. M. Morgan writes:—"A pair of *Sauloprocta motacilloides* were constantly about my house at Laura, one hundred and forty miles north of this city, and built every year in the garden. In 1895 they constructed a nest in an apricot tree near my surgery window, which was lined entirely with hair taken from the back of my cat. On the first day, the cat tried all she could to catch them, but although her claws were often within an inch or two of the birds, she never succeeded in getting them. The air of indignant surprise on the part of the birds at the cat's remonstrance, was most ludicrous. After the first day, the cat made no attempt to catch them, but calmly allowed herself to be despoiled."

The eggs are usually three, sometimes four in number for a sitting, and vary in form from oval to elongate-oval, some specimens being somewhat sharply pointed at the smaller end, the shell being close-grained, smooth, and slightly lustrous. Typically they vary in ground colour from pale creamy-brown to creamy- and yellowish-white, and have usually a well defined zone of confluent dots and spots on the larger end, or around the centre of the shell, of dark

yellowish-brown, ashy-grey, and bluish-black, the latter colour appearing as if beneath the surface. In some specimens the zone is irregularly formed of indistinct yellowish-brown fleecy markings, intermingled with irregular shaped clouded spots and blotches of dull inky-grey, minute dots of the same hues being sparingly distributed over the remainder of the shell; in others they are more uniformly dotted, spotted, or blotched, but as a rule they predominate in the form of a zone towards the larger end. Among rare varieties, I have a set of three eggs which are pure white, with a well defined band of blackish-brown, yellowish-brown, and inky-grey spots and small blotches around the larger end of the shell. Another set has a pale yellowish ground colour, with a few small underlying spots of bluish-grey on the larger end, and a dark creamy-brown cap on the smaller end, which is sparingly dotted and spotted with blackish-brown. I have also taken specimens which have only a large coalesced patch of underlying inky-grey markings on one side of the shell. A set of three measures:—Length (A) 0.8×0.56 inches; (B) 0.8×0.6 inches; (C) 0.81×0.59 inches. A set of four measures:—(A) 0.84×0.63 inches; (B) 0.84×0.62 inches; (C) 0.84×0.62 inches; (D) 0.84×0.63 inches. A small-sized set of three measures:—(A) 0.7×0.58 inches; (B) 0.69×0.57 inches; (C) 0.76×0.58 inches.

In a set of three, taken by Mr. G. A. Keartland in North-western Australia, the eggs are oval in form and of a cream-buff ground colour, with a band of small dull chestnut-red spots on the thicker end, intermingled with underlying markings of pale bluish-grey. Length:—(A) 0.73×0.56 inches; (B) 0.75×0.56 inches; (C) 0.73×0.58 inches.

Nestlings have the upper surface and throat smoky black; a broad eyebrow white; chest, breast, and abdomen dull white, passing into pale buffy-white on the vent and under tail-coverts. Wing 2.8 inches.

Young birds are slightly darker on the upper parts than the nestlings; the feathers of the lower back and rump have indistinct buff tips; upper wing-coverts brown tipped with buff, more largely on the greater series; the white line above the eye is longer, and extends on to the sides of the nape. Wing 3.9 inches. There are two beautiful albino specimens in the Australian Museum collection, having the whole of the plumage of a pure snow-white; bill, legs, and feet yellow.

August and the four following months constitute the usual breeding season of this species in Eastern and Southern Australia, but nests containing fresh eggs have been found near Sydney on the 31st of December, and in the Hamilton District, Victoria, on the 9th January.

Genus *SISURA*, Vigors & Horsfield.

Sisura inquieta.

RESTLESS FLYCATCHER.

Turdus inquietus, Lath., Ind. Orn., Suppl., p. xl., (1801).

Sisura inquieta, Gould, Bds. Austr., fol., Vol. II., pl. 87 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 246 (1865).

Sisura inquieta, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 407 (1879).

ADULT MALE—General colour above black, with a greenish-grey gloss; upper tail-coverts blackish, margined with glossy bluish-black; lesser and median upper wing-coverts like the back; the greater coverts, also the inner secondaries slightly glossed with bluish-black; quills dark brown; tail blackish-brown; head and sides of the neck lustrous bluish-black; a triangular patch in front of the eye velvety-black; all the under surface pure white; sides of the chest dull black; under tail-coverts white; bill black; legs and feet black; iris dark brown. Total length in the flesh 8.3 inches, wing 4.2, tail 3.8, bill 0.8, tarsus 0.75.

ADULT FEMALE—*Slightly duller in colour on the upper parts than the male; the triangular patch of feathers in front of the eye is dusky-grey, and the throat and breast is tinged with ochraceous-buff.*

Distribution.—Queensland, New South Wales, Victoria, South Australia, Western Australia.

THE Restless Flycatcher is distributed over the greater portion of Queensland, New South Wales, Victoria, South and Western Australia. It frequents alike the coastal brushes, open forest and grass lands, and the margins of rivers and creeks inland. Among the specimens in the Australian Museum collection, are some obtained by Messrs. E. J. Cairn and R. Grant in the open parts of the scrub near Cairns, North-eastern Queensland: from the Darling River, about six hundred miles west of Sydney, procured by the same collectors; and examples from Mongup, Salt River, Western Australia, obtained by Mr. George Masters in January, 1869. The wing measurement of all these specimens only varies from 3.95 to 4.1 inches. Some adult males, however, procured in the same localities, have the throat and breast tinged with buff, in others it is pure white.

In New South Wales, *Sisura inquieta* is a permanent resident, and is fairly numerous in the neighbourhood of Sydney, frequenting, in addition to its natural haunts, gardens, orchards, and vineyards, but it is seldom seen in the parks or gardens of the city. In general appearance this bird bears a striking resemblance to the Black and White Fantail, but it may be easily distinguished from that species by its uniform white under surface; it is also more arboreal in habits.



RESTLESS FLYCATCHER

Although a resident species, it is more conspicuous in spring and summer, for it is principally during these seasons that its peculiar grinding note is uttered while hovering in search of insects a few feet above the grassy sward, and from which it derived the local name of "Grinder." When perched on the end of a dead branch—a favourite position of this species—it also frequently utters a single harsh note, which is sometimes varied with a clear whistling double-note resembling "tu-who tu-who." During autumn and winter it is almost silent, and its singular whirring

note is seldom heard. It is very tame, and solitary examples often visit my garden and the fences surrounding the house.

The food of this species consists chiefly of insects of various kinds, principally flies, small moths, and butterflies, captured more frequently while on the wing. It also eats caterpillars, and materially assists in ridding orchards of many injurious pests.

The nests of the Restless Flycatcher vary considerably in size and in the materials of which they are composed. Typically they are neat round cup-shaped structures, built of very fine strips of stringy bark, bound round and held together with spiders' webs, the exterior being more or less decorated with lichens, and the inside lined with fur or hair. An average nest measures externally three inches and a half in diameter by two inches and a half in depth; internal diameter two inches and a half, depth one inch and a half. A nest in the Australian Museum collection, taken by the late Mr. K. H. Bennett, at Yandembah, is formed of strips of bark and grasses, thickly and evenly coated externally with wool, the rim of the nest being nicely rounded, and the inside lined with white fowls' feathers. It measures externally four inches in diameter by three inches in depth; internal diameter two inches and a half, by one inch and a half in depth.

The nest is usually placed on the top of a forked horizontal bough, often on one that is dead, or built against a thin upright leafy twig. Occasionally it is formed in and around a nearly upright fork. A favourite position is in an acute angle formed by a bent or distorted branch. It is generally built near the extremity of a limb, and well away from the trunk of a tree. The different species of *Eucalypti* are the trees most frequently resorted to for nesting in, and the nests are built from twenty to sixty feet from the ground. There is a very pretty nest of this species in the Group collection of the Australian Museum. It was built in a Forest Mahogany (*Eucalyptus resinifera*), at Eastwood, and was taken by Mr. S. W. Moore on the 19th November, 1899. At Roseville a pair of these birds built in a tree near my house for two successive seasons, and on the tree being cut down the next one was resorted to by presumably the same pair in the following season.

The eggs are usually four in number for a sitting, and vary in shape from oval and rounded oval to elongate and elliptical oval, the shell being close-grained and its surface smooth and slightly lustrous. They vary in ground colour from dull white to warm buffy-white, and are usually marked on the larger end or around the centre of the shell with a well defined band of dull purplish or chestnut-brown confluent irregular-shaped spots and blotches intermingled with similar underlying markings of dull violet-grey, the remainder of the shell being but sparingly spotted with the same colour or entirely free from markings. In some specimens the underlying spots are larger and darker, and form a clouded band, in others they are absent, while some have the spots and blotches distributed almost uniformly over the surface of the shell, but as a rule they predominate on the thicker end. A set of four measures as follows:—Length (A) 0.85×0.65 inches; (B) 0.86×0.66 inches; (C) 0.84×0.65 inches; (D) 0.85×0.65 inches. Another set of four measures:—(A) 0.78×0.63 inches; (B) 0.79×0.63 inches; (C) 0.77×0.62 inches; (D) 0.77×0.63 inches. A set of three measures:— 0.84×0.6 inches; (B) 0.83×0.62 inches; (C) 0.82×0.6 inches.

Fledgelings are dusky blackish-brown above, the scapulars being largely tipped with dull white; quills and upper wing-coverts dull brown, the latter having buffy-white tips; throat and upper part of the breast white washed with ochraceous-buff. Wing 3.3 inches.

At Port Augusta, South Australia, Dr. A. M. Morgan observed a pair of these birds building in a huge gum tree, on the 14th August, 1900. Nidification in the neighbourhood of Sydney commences generally about the first week in September; and in the northern coastal districts of the State and southern parts of Queensland as early as August. Two broods are reared during the season, which continues until the end of January. Before the young essay their first flight, they perch on the edge of the nest, or on the branch in close proximity to it. At Chatswood and Roseville I have noted, during a period of five years, the first broods leaving the nests from the 3rd to the 19th of October.

Sisura nana.

LITTLE FLYCATCHER.

Seisura nana, Gould, Ann. & Mag. Nat. Hist., Ser. 4, Vol. VI., p. 224 (1870).

Sisura nana, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 408 (1883); North, Proc. Linn. Soc. N.S.W., Vol. XXVII., p. 207 (1902).

ADULT MALE—*Similar to the adult male of* *SISURA INQUIETA*, *but smaller, and the bill comparatively broader. Total length 6.5 inches, wing 3.5, tail 3.3, bill 0.5, tarsus 0.7.*

ADULT FEMALE—*Like the male, but having the triangular shaped patch in front of the eye dusky-grey, and the throat and breast tinged with ochraceous-buff.*

Distribution.—North-western Australia, Northern Territory of South Australia, Western New South Wales.

THIS species, inhabiting chiefly the northern and north-western portions of the continent, is similar in colour to *Sisura iniqueta*, but is decidedly smaller, and does not intergrade with the latter. Gould, in the original description, gives the wing measurement of the type as $3\frac{3}{4}$ inches. The wing measurement of two adult females, procured at Derby, North-western Australia, by the late Mr. T. H. Bowyer-Bower, is alike $3\frac{3}{4}$ inches; that of an adult male, obtained by Mr. J. Ramsay, at Tyndarie, Western New South Wales, in 1882, is $3\frac{1}{2}$ inches. The latter specimen is the only one I have seen from the southern portion of the continent, and the bill is not so broad as in North-western Australian specimens. The examples from Derby have their bills comparatively broader than typical specimens of *Sisura iniqueta*.

An egg of *Sisura nana*, in the collection of Mr. Chas. French, Junr., taken near the Daly River in the Northern Territory of South Australia in January, 1902, is oval in form, the shell being close-grained, smooth, and lustreless. It is of a dull buffy-white ground colour, irregularly spotted and blotched with umber-brown, and similar underlying markings of greyish-lilac, which form an irregular band around the larger end. Length:— $0\cdot71 \times 0\cdot5$ inches.

Genus ARSES, Lesson.

Arses kaupi.

KAUP'S FLYCATCHER

Arses kaupi, Gould, Proc. Zool. Soc., 1859, p. 278; *id.*, Handbk. Bds. Aust., Vol. I., p. 251 (1865); *id.*, Bds. Austr., fol., Suppl., pl. 10 (1869); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 411 (1879).

ADULT MALE—*Lores, crown of the head and nape, feathers below the eye, and the ear-coverts rich bluish-black; a broad collar on the hind-neck pure white; mantle and upper portion of the back glossy bluish-black; scapulars, feathers of the lower portion of the back and the rump white with black bases; upper tail-coverts black; wings and tail black; chin, cheeks, and throat pure white; a broad band across the breast glossy bluish black; abdomen and under tail-coverts white; bill bluish-horn colour at the base, lighter at the tip; feet leaden-black; orbital rattle dark blue. Total length 6 inches, wing 3.15, tail 3, bill 0.4, tarsus 0.75.*

ADULT FEMALE—*Duller in colour than the male; wings and tail brownish-black; the chin and upper throat only white, and not connected with the broad white band on the hind-neck, which has most of the feathers narrowly edged at the tip with black.*

Distribution.—North-eastern Queensland.

THE two species of Frill-necked Flycatchers inhabiting Australia are doubtless of Papuan derivative, for their range is exclusively confined to that portion of the continent in which is also found so many representatives of the Papuan flora. The habitat of the present species extends throughout the greater portion of that tropical belt extending from Cape York as far south as the Herbert River. Judging by the numerous specimens in the collection obtained by Messrs. Cairn and Grant in the Bellenden Ker Range, it is apparently freely distributed towards its southern limits, where the late Mr. Edward Spalding procured adults and young in the brushes of the Herbert River in 1874. During the stay of the "Chevert" Expedition at Cape York, in 1875, Mr. George Masters succeeded in obtaining one specimen, the only one seen.

In habits it differs from the typical members of the family *Muscicapidæ*, in resorting to the trunks and branches of trees from which it procures most of its food after the manner of the *Certhiidae*, its long claws and powerful hind-toe being admirably adapted for the purpose.

The long crested feathers on the nape are not shown in Gould's two figures of the male, in his Supplement to the "Birds of Australia." Some adult males have a small black spot on the chin, as represented in Gould's figures, but as a rule it is absent.

From Kuranda, on the Upper Barron River, the late Mr. W. S. Day wrote to me as follows:—"Kaup's Flycatcher is fairly common in the scrub lands of the Barron, Mulgrave, Russell, and Johnstone Rivers, its favourite haunts being near a running stream. It has a pretty way of erecting the white frill around its neck, and often clings or runs up the stem of a tree like a Tree-creeper. During flight the tail is spread in a similar manner to that of the Rufous-fronted Flycatcher; and its strikingly contrasted plumage renders it a remarkably conspicuous bird when seen flying about the scrub."

Mr. Grant also writes:—"Among the luxuriant foliage, and dark stained tree-trunks of the giants of the forest of the Bellenden Ker Range, one's attention is frequently arrested by the lively actions and conspicuous plumage of Kaup's Flycatcher. When first seen creeping or running up and down trunks of trees, it gives one the impression that it is a species of Tree-creeper and not a Flycatcher. With half-open wings and crest erect, it swiftly traverses the trunks or branches of trees, ever and anon thrusting its bill into some little cavity or tearing off a loose piece of bark in search of food which consists of various kinds of insects, principally small moths and their larvæ."

From the Bloomfield River District, North-eastern Queensland, Mr. Frank Hislop has also favoured me with the following:—"Kaup's Flycatcher, although sometimes seen in the open forest land, always builds in or just at the edge of the scrub. The nest is a small open basket-like structure, suspended between two pieces of vine or attached to a pendant branch. It is formed of vinelets and thin twigs, interwoven together, and is ornamented on the outside with pieces of lichen fastened on with cobwebs. Very often it is built in a tree or vines overhanging a road cut in the scrub, and is usually between twenty and thirty feet from the ground. Two eggs are laid for a sitting, and the breeding season is in November and December."

A nest of this species in the National Museum, Melbourne, taken in the Bloomfield River District, is an open cup-shaped structure, and resembles in form a miniature hanging basket, being attached on both sides, which are slightly raised, to two thin pendant parallel stems of a vine. It is formed of the thin dried stalks of a small fern, bound round and held together on the outside with spiders' webs, and ornamented with large pieces of lichen; the inside being lined with fine hair-like rootlets. Externally it averages two inches and a half in diameter, and its greatest depth at the sides two inches and a half, the inner cup averaging one inch and four-fifths in diameter by a depth of one inch and a half.

Young birds are duller in colour than the female, and have the lower portion of the back and the rump brownish-grey; upper tail-coverts blackish-brown; wings and tail brown; the feathers on the hind-neck being broadly tipped with dull black, and those on the chin and throat having brownish-black bases giving it a mottled appearance; band on the breast dusky-brown, with pale brown tips to most of the feathers; bill yellowish-brown at the base, blackish-brown at the tip. Wing 2·8 inches.

Arses lorealis.

WHITE-LORED FLYCATCHER.

Arses lorealis, De Vis., Proc. Linn. Soc. N.S.W., 2nd ser., Vol. X, p. 171 (1895).

ADULT MALE—Crown of the head, nape, face, feathers below the eye and the ear-coverts glossy black; collar on the hind neck white; scapulars and mantle black, with a slight gloss, the former largely tipped with white, also the feathers of the lower mantle; lower portion of the back and the rump blackish-grey, with white tips to all the feathers; upper tail-coverts black; tail brownish-black; upper wing-coverts like the mantle; quills brownish-black; lores white; chin, all the under surface, and under tail-coverts white; bill black; legs and feet black; iris dark brown; orbital wattle bright blue. Total length 5 inches, wing 3·1, tail 2·8, bill 0·42, tarsus 0·72.

ADULT FEMALE—Differs from the male in being duller in colour and destitute of the large white tips to the scapulars and feathers of the lower mantle; the outer webs of the secondaries, both webs of the scapulars, and some of the greater wing-coverts are edged with rufous; the feathers of the nuchal collar are narrowly tipped or subterminally barred with black, and those on the lower throat are broadly tipped with pale buff, forming a band on that part.

Distribution.—Northern portion of Cape York Peninsula.

THIS very distinct species was described by Mr. C. W. De Vis, M.A., the Curator of the Queensland Museum, from specimens obtained by Mr. Kendal Broadbent, at Cape York, who states that its haunts and habits are similar to those of *A. kaufi*, Gould. It is remarkable that the sexes of both species of this genus inhabiting Australia so closely resemble one another, while *A. telescopthalmus*, *A. aruensis*, *A. batanti*, and *A. insularis*, found in New Guinea and the Papuan islands, should be so different in colour. Mr. De Vis has been so good as to lend me his types, and, through the courtesy of Dr. E. C. Stirling, Director of the South Australian Museum, I have also received additional specimens from that institution for examination. Two of the latter birds are slightly darker and more glossy than the type described by Mr. De Vis as the adult male, but both are marked as females. They are labelled *Arses candidior*, Somerset, Cape York, and dated respectively 27th October, and 4th December, 1896. Under the same name, and obtained on the 20th November, 1896, is another specimen, marked male, that is indistinguishable from the adult male of *A. aruensis*, differing only from examples of the latter, obtained near Port Moresby, by the lower portion of the black mark on the chin being more rounded in form and its slightly smaller bill. A fourth specimen, also a male, with a mutilated bill and unlocalised, is apparently, by its make up, from the same district. In the Macleay Museum there is also a similar adult male, labelled Cape York, September, 1875.

Mr. De Vis writes me as follows:—"There is evidently some misconception about *Arses candidior*, arising doubtless from the presence of that name on the original cabinet label of *A. localis*. *Arses candidior* seems to have been given by Mr. K. Broadbent to an enquirer asking him the name of the bird; hence the idea that I have named two species of the genus."

A nest of this species in the National Museum, Melbourne, taken at Somerset, Cape York, in December, 1896, is very similar to that of its close ally *A. kaufi*. It is a round open pensile structure, formed externally of thin flowering plant stalks, intermingled with black and brown rootlets and lightly coated with spiders' webs, the inside being lined entirely with fine black rootlets. On the outer portion it is decorated with pieces of green lichen, fastened on with spider's webs. Externally it measures two inches and three-quarters in diameter by three inches in depth; and the inner cup two inches in diameter by one inch and a half in depth. The nest is firmly attached on both sides to the thin parallel stems of a forked pendant vine, which gives the structure the appearance of a hanging basket. Eggs two in number for a sitting. A set kindly lent me by the late Dr. Charles Snowball, and taken at Somerset on the 3rd January, 1897, are oval in form, the shell being close-grained, smooth, and lustreless. They are of a pale buffy-white ground colour, which is uniformly freckled with dull red; one specimen having the markings darker and more pronounced on the thicker end, where are intermingled a few faint purplish underlying spots. Length:—(A) 0.77 × 0.56 inches; (B) 0.76 × 0.55 inches.

Genus **PIEZORHYNCHUS**, Gould.**Piezorhynchus nitidus.**

GLOSSY FLYCATCHER.

Piezorhynchus nitidus, Gould, Proc. Zool. Soc., 1840, p. 171; *id.*, Bds. Austr., fol., Vol. II., pl. 88 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 219 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 416 (1879).

Monarcha nitidus, Salvad., Orn. Pap. et Molluc., Pt. II., p. 35 (1881); Schater, Proc. Zool. Soc., 1883, pp. 51, 58.

ADULT MALE—*General colour above and below glossy greenish-black: primaries, secondaries, and tail feathers black, margined externally with glossy greenish-black: bill bluish-black: legs black: iris reddish-brown. Total length 7 inches, wing 3.5, tail 3.3, bill 0.55, tarsus 0.85.*

ADULT FEMALE—*Crown, sides of the head, and hind neck, glossy greenish black: remainder of the upper surface rich chestnut, the mantle slightly washed with greenish-black: tail feathers rich chestnut: upper wing-coverts like the back, with a greenish-black wash on the lesser and median series, and which is more distinct on the outermost greater coverts, and the tips of the primary coverts: innermost secondaries like the back: the remainder and the primaries dark brown, broadly margined with rich chestnut on their outer webs: cheeks, sides of the neck, all the under surface and under tail-coverts white. Total length 6.5 inches, wing 3.2, tail 3, bill 0.53, tarsus 0.85.*

Distribution.—Northern Territory of South Australia, Northern and North-eastern Queensland, Aru Islands, Timor Laut or Tenimber Group of Islands.

THE Glossy Flycatcher inhabits the mangrove flats of rivers, and the thick brushes in the vicinity of creeks in the coastal districts of the northern and north-eastern portions of the continent. The late Mr. Edward Spalding found it plentiful in the mangroves at Port Darwin; and Mr. A. Morton obtained adults and semi-adults of both sexes at Port Essington in February, 1879. On the north-eastern coast, from Cape York as far south as the Herbert River, it has been obtained by numerous collectors. Mr. J. A. Thorpe procured many specimens at Somerset in 1867-8; and the members of the "Chevert" Expedition found it plentifully distributed throughout the mangroves in the same locality in 1875. Mr. Frank Hislop informs me it is common along the banks of creeks in the Bloomfield River District, and that he has never seen it further than one hundred yards away from water. Messrs. Cairn and Grant procured specimens near the margins of fresh-water creeks at Cairns. Mr. J. A. Boyd informs me it is freely distributed in the vicinity of either the fresh or salt-water creeks in the Herbert River District; and there is an adult male in the collection obtained by Mr. George Masters in 1867 as far south as Port Denison. Gould states, in his original description, that the type was procured by Mr. E. Dring, Surgeon of "H.M.S. Beagle," on the north-western coast of Australia. It is also found in the Aru Islands; and Dr. Schater has recorded it from Larat, in the Timor Laut or Tenimber group of islands.

Mr. Bertie L. Jardine writes me as follows:—" *Piezorhynchus nitidus* is found throughout the year on the Cape York Peninsula and the islands of Torres Strait. It chiefly inhabits the dense and dark portions of mangrove flats that border the inlets and bays. Owing to the depth of mud, interlacing network of roots, innumerable sandflies and mosquitoes, the habits of this species are generally difficult to observe. Usually these birds are met with in pairs, hopping or flying about the lower branches and roots of the mangroves, and the rapidity with which they work their way among the latter is marvellous. Occasionally they may be seen inland in the tea-tree scrub bordering the margins of fresh-water swamps and lagoons. They are wonderfully quick and active, and live chiefly on insects which are often secured in a similar manner to a lizard stalking a fly, remaining motionless for a time and then suddenly darting forth and seizing their prey."

The nest is a round cup-shaped structure, formed of strips of bark held together with a thin net-work of spiders' webs, and ornamented on the outside with small scales of bark or a few bits of lichen, the inside being thickly and neatly lined with fibrous roots. Some nests are more highly decorated than others: one sent me for examination by the late Mr. W. S. Day, with the birds shot from it, and the eggs, was thickly coated on the outside with lichens, only revealing here and there the bark of which it was chiefly constructed. An average nest measures externally three inches and a quarter in diameter by two inches and a quarter in depth, the inner cup measuring two inches and a half in diameter by one inch and a half in depth. They are usually built in trees or in vines overhanging water. When at the Herbert River, North-eastern Queensland, Mr. J. A. Boyd kindly forwarded the nests and eggs of this species. A novelty, taken by Mr. P. Cochrane, at Ripple Creek Sugar Plantation, consisted of three nests, one being placed inside the other, each evidently built by the same pair of birds. Being constructed inside one another, only about half of the last nest built is visible externally, which measures barely one inch and a half in height, the three structures altogether measuring three inches and a half in height. Although a thin network of spiders' webs has been worked over the exterior of all the nests, each shows separate and distinct. These nests were found on the 17th October, 1893, when the female was sitting on two fresh eggs. Mr. Cochrane sent me a well executed sketch, showing the position and surroundings of four nests he had found of this species. He informs me all were built over the water in gloomy situations where the thick foliage above shut out all sunlight, and they varied in height from five to twenty feet. One nest was constructed at the junction of a three-pronged and partially upright thin branch; another was built in a fork at the end of a long, bare, dead branch projecting from the bank of a creek. The third nest found was suspended over the water at the junction of a long forked pendant rope-like vine; and the last one taken, built on top of two old nests, was placed in the angle of a bent green leafy branch, some distance above the water. There was some danger in procuring this nest and eggs as it was immediately above the well-known lurking place of a large crocodile that had haunted the locality for some time. Mr. Boyd found a nest of this species in January, 1888, built on the dead branch of a tea-tree that had fallen into a waterhole; also another at the Valley of Lagoons, on the Herbert River, on the 11th December, 1892.

The eggs are usually two, sometimes three in number for a sitting, and vary in form from oval to elongate-oval, some specimens being rather pointed at the smaller end; the shell is close-grained and its surface smooth and almost lustreless. They are of a faint bluish-white ground colour, minutely freckled, dotted, and spotted with dull slaty-black, slaty-brown, or olive-brown, intermingled with similar faint underlying markings of slaty or lilac-grey predominating as usual on the larger end, where in some specimens a more or less well defined zone is formed. A set of two eggs in the collection of Mr. Charles French, Junr., taken near the Daly River in the Northern Territory of South Australia, on the 18th January, 1902, are of a pale bluish-white, one having a zone on the larger end, the other a broad band around the centre formed of spots and large blotches of wood brown, intermingled with numerous freckles of dull inky-grey. Length: (A) 0.81×0.62 inches; (B) 0.8×0.61 inches. A set of three eggs in the Australian Museum collection, taken in the same locality on the 15th February, 1902, measures: Length (A) 0.78×0.59 inches; (B) 0.76×0.58 inches; (C) 0.77×0.58 inches. A set of two, taken on the 17th October, 1893, at Ripple Creek, Herbert River, Queensland, measure as follows: Length (A) 0.89×0.61 inches; (B) 0.9×0.62 inches. Another set of two, taken in the same locality measures:—(A) 0.82×0.57 inches; (B) 0.83×0.58 inches.

Young males are similar in plumage to the female, but are duller in colour. Young males in change of plumage have some of the feathers on the mantle, and the upper wing-coverts and breast glossy greenish black, and a few of the quills and tail feathers black, margined externally

with greenish-black; lores and sides of the head dull black; crown of the head dull greenish-black. Wing 3.2 inches.

October and the four following months constitute the usual breeding season of this species in North-eastern Australia, but I have examined many nests and sets of fresh eggs that were collected in the Northern Territory of South Australia during December, January, and February.

Genus MYIAGRA, Vigors & Horsfield.

Myiagra rubecula.

LEADEN-COLOURED FLYCATCHER.

Todus rubecula, Lath., Ind. Orn., Suppl., p. xxxii., (1801).

Myiagra plumbea, Gould, Bds. Austr., fol., Vol. II., pl. 89 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 252 (1865); Salvad., Orn. Pap. et Mollusc., Pt. II., p. 74 (1881).

Myiagra rubecula, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 373 (1879).

ADULT MALE—*General colour above leaden-grey, slightly glossed with steel-green, more distinct on the head; quills blackish, washed with leaden-grey on their outer webs, more distinct on the inner secondaries, which are externally edged with ashy-white; tail feathers leaden-grey; a narrow frontal line and feathers in front of the eye, blackish; sides of the face, neck, throat, and fore-neck, slightly darker than the crown of the head, and more strongly washed with steel green; remainder of the under surface and the under tail coverts white; bill dark leaden-blue, blackish at the tip; legs and feet black; iris black. Total length in the flesh 6 inches, wing 3.15, tail 2.7, bill 0.5, tarsus 0.6.*

ADULT FEMALE—*General colour above dull leaden-grey, slightly browner on the back; upper wing-coverts and quills brown, the secondaries externally edged with ashy-grey; tail-feathers brown; feathers below the eye and ear-coverts dusky-brown; chin, throat, and fore-neck pale orange-buff, gradually becoming lighter on the breast and dull white on the remainder of the under surface and the under tail-coverts.*

Distribution.—North-western Australia, Northern Territory of South Australia, Queensland, New South Wales, Victoria, Tasmania, New Guinea.

IN favourable situations the present species is distributed over the greater portion of North-western, Northern, Eastern, and South-eastern Australia. It also inhabits Yule Island and New Guinea, and is occasionally found in Tasmania. There is but little variation in the wing-measurement of examples obtained on the Laloki River, New Guinea, and from different parts of the eastern coast of Australia; the wing measurement of an adult male from the former locality being the same as that of the above described male obtained close to Sydney, 3.15 inches. The loreal streak, however, is not so dark as in the Australian specimen. This is, I believe, due to age, for even in examples obtained in the same locality, it is very much darker in some specimens than others. Some adult males have a blackish wash on the feathers below the eye and the ear-coverts.

It is a strictly migratory species, arriving in New South Wales from its northern haunts in September, and departing again after breeding, about the end of March. On the highlands of the Milson's Point railway-line, in the neighbourhood of Sydney, I have more often noted its arrival during the month of October; and I saw a female at Middle Harbour, on the 20th May, 1898, but this was unusually late for it to remain. It frequents the coastal scrubs and contiguous mountain ranges, and is never found far inland in the drier portions of the State. Except when accompanied by its young, this species is usually met with in pairs, resorting principally to the branches of the taller *Eucalypti* or *Angophoræ* in secluded gullies, or in forest lands with a slight undergrowth. Although of extremely active habits one's attention is more frequently directed to this species by its squeaking note, which can be heard some distance

away. It is difficult to convey any idea of this guttural sound: but from its peculiar note it is known locally about Sydney as the "Frog-bird." When uttered, it is generally accompanied with a tremulous motion of its tail. The first time I saw one of these birds, an adult male, it was bathing in a creek, and when disturbed by my approach, it flew into a low tree close by. The peculiar lateral movements of the tail I attributed to the bird drying its feathers, but I subsequently observed that this action was nearly always performed immediately after flight.

Mr. Frank Hislop informs me that in the Bloomfield River District, North-eastern Queensland, it is a resident species throughout the year, and is as a rule seen more often on the tea-tree and bottle-brush flats than the higher land.

The nest is a round open cup-shaped structure, formed chiefly of fine strips of bark, bound round and held together on the outside with spiders' webs, the inside being sparingly lined with fine wiry rootlets. Externally attached are small scales of bark, which are again covered with a fine network of spiders' webs. Some nests have a mottled appearance, caused by the grey outer surface of the bits of bark, or the red inner surface being alternately exposed: others are profusely decorated on the rim and the exterior portion with pieces of pale green lichen; but all are neat and beautiful structures, and are made to resemble their surroundings. The shape of the nest varies with its position: if built on the top of a thick horizontal bough, it is more often broader at the base than the top. An average nest measures externally two inches and a quarter in diameter by two inches and a quarter in depth, the inner cup measuring one inch and three quarters in diameter by one inch and a half in depth. They are usually built well away from the trunk of the tree, on the top of a horizontal bough, and frequently at the junction of a forked dead branch, or in the angle formed by a bent or twisted branch. The different species of the larger *Amalopti* and *Angophoræ* are usually resorted to as nesting sites, and as a rule the nests are built high up, at heights varying from thirty to eighty feet, but on one occasion I heard of it being found within ten feet of the ground.

The eggs are usually three, sometimes only two in number for a sitting, and are ovals or rounded ovals in form, the shell being close-grained, smooth, and almost lustreless. They vary in ground colour from faint bluish-white to pure white, which is dotted or spotted around the centre or on the larger end of the shell with amber-brown or pale purplish-brown, intermingled with underlying spots of dull violet-grey, and there usually forming a more or less well defined zone. Some specimens have a band of small confluent brown blotches around the centre of the shell, and are entirely devoid of underlying markings, others are very sparingly spotted and dotted with pale brown, or purplish-brown, and in some eggs the dull violet-grey underlying spots are more numerous: as a rule, however, whether the markings are few or many, they are more thickly disposed around the centre or larger end of the shell. A set of three, taken on the 14th October, 1900, measures as follows:—Length (A) 0.67×0.53 inches; (B) 0.68×0.54 inches; (C) 0.68×0.54 inches. Another set of three, taken on the 11th December, 1901, measures:—(A) 0.73×0.57 inches; (B) 0.75×0.58 inches; (C) 0.76×0.58 inches.

October and the three following months constitute the usual breeding season of this species in Eastern Australia, although nests with eggs are found more often in the neighbourhood of Sydney at the latter end of November, or in December. At Ashfield I saw fledgelings being fed by their parents at the end of January. The male assists in the duties of incubation, and, in the Upper Clarence River District, Mr. G. Savidge informs me that the male also does the principal part of the nest building.

Myiagra concinna, Gould, I regard only as a slightly smaller northern, and north-western race, hardly separable from the present species. Gould's description of the male of *M. plumbea* and *M. concinna* in his folio edition of the "Birds of Australia," are alike, word for word; so are his plates, except that the dark leaden grey colour of *M. concinna* does not extend so far down on to the fore-neck as in the plate of *M. plumbea*. His descriptions of the

females are also nearly alike; in describing *M. concinna* he remarks: "abdomen and under tail-coverts white, which colour does not gradually blend with the rusty-red of the breast as in the female of *Myiagra plumbea*." This, however, even if it constituted a sufficient character to distinguish a species, is not constant, for some adult females now before me from Derby, North-western Australia, and the Northern Territory of South Australia, are indistinguishable from examples obtained in New South Wales. By picking out the extremes of a large series from all parts of Australia, one could readily distinguish a smaller northern race, but not a distinct species.

Dr. Sharpe remarks, in the "Catalogue of Birds in the British Museum," as follows: - "I consider *M. concinna* to be really a distinct species, but on totally different grounds from those given by Mr. Gould. Indeed, if we did not know that his specimens were from North-western Australia, his figures and descriptions would be referable to *M. rubecula*. The chief difference in the male birds is the presence of the black frontal line and black lores of *M. concinna*." In the "Voyage of H.M.S. Alert,"[†] Dr. Sharpe refers the specimens collected at Booby, West, Thursday, and Friday Islands to *Myiagra concinna*, and makes the following remarks:—"The differences between this species and *M. rubecula*, are to my mind not satisfactorily established; but until better specimens reach the British Museum from North-western Australia, (the habitat of the typical *M. concinna*), it will be difficult to settle the question." In describing the adult male of *M. rubecula*, in the "Catalogue of Birds in the British Museum," Dr. Sharpe writes: "feathers in front of the eye dull greyish."

All the Australian specimens I have examined have a more or less defined narrow frontal line and the lores varying from a dull to deep black. These characters are more pronounced in an otherwise typical specimen of *Myiagra rubecula*, obtained by Mr. George Masters at Gayndah, on the Burnett River, Queensland, in September, 1870, which has these parts a deep velvety-black. The only difference I can find between extreme northern and north-western examples, and those obtained in New South Wales, is that as a rule the latter are slightly larger, the lores and frontal line are of a duller black, and the leaden-grey feathers of the male, extends slightly lower down on the fore-neck.

Count Salvadori refers the birds obtained by Dr. Loria, near Port Darwin, to *M. plumbea*.[‡] Specimens in the Macleay Museum, collected in the same locality, have the upper parts less glossy than typical examples of *Myiagra rubecula* obtained in the southern portions of the continent.

The eggs of this northern race vary in ground colour from faint bluish-white to warm white, and are zoned around the centre or on the larger end with dots and spots of light purplish-brown, intermingled with underlying spots of dull violet-grey, and being but sparingly marked over the remainder of the shell. In some specimens the markings are confluent and form a more or less well defined band on the larger end. They are indistinguishable, except for their slightly smaller size, from those of *Myiagra rubecula*. A set of two measures:—Length (A) 0.7 × 0.58 inches; (B) 0.69 × 0.57 inches.

* Cat. Bds. Brit. Mus., Vol. iv., p. 374 (1879).

† Rep. Zool. Coll. H.M.S. Alert, p. 14 (1884).

‡ Ann. Mus. Civ. Gen., Vol. xxix., p. 497 (1890).

Myiagra nitida.

SHINING FLYCATCHER.

Myiagra nitida, Gould, Proc. Zool. Soc., 1837, p. 142; *id.*, Bds. Austr., fol., Vol. II., pl. 91 (1848);
id., Handbk. Bds. Austr., Vol. I., p. 255 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV.,
 p. 375 (1879).

ADULT MALE.—*General colour above glossy greenish-black; upper wing-coverts like the back; primaries, secondaries, and tail feathers black margined externally with glossy greenish-black; lores, and a broad frontal line deep velvety black; sides of the neck, throat, fore-neck, and upper portion of the breast glossy greenish-black; remainder of the under surface and under tail-coverts white; bill leaden-black; legs and feet black; iris black. Total length in the flesh 6.5 inches, wing 3.5, tail 3.2, bill 0.45, tarsus 0.62.*

ADULT FEMALE. *General colour above dull slaty-grey, the feathers of the head darker and tipped with glossy greenish-black; lesser and median upper wing-coverts like the back; quills and greater wing-coverts brown; the secondaries narrowly edged externally with ashy-brown; tail brown, the four central feathers having a blackish wash; lores blackish-brown; chin, sides of the neck, throat, and fore-neck orange-rufous; remainder of the under surface and under tail-coverts white. Total length 6.3 inches, wing 3.4, tail 3.1, bill 0.45, tarsus 0.62.*

Distribution.—Queensland, New South Wales, Victoria, Tasmania.

THE present species is sparingly distributed over most parts of the eastern and south-eastern portions of the Australian continent. In New South Wales it is more frequently met with in the Blue Mountains and in the open forest country further inland, from October until the end of February. Mr. R. Grant informs me that it is the commonest bird in the bush at Lithgow during the month of November, keeping about half-way up the hill-sides, and breeding in forest-oaks and gums. During the spring and summer months it is also fairly numerous in Tasmania, where it remains to breed. I have never seen it near the coast in New South Wales, but there is an adult male in the collection procured at North Shore, Sydney, in October, 1867.

In habits it closely resembles its ally, *M. rubecula*, being constantly on the move, and frequently swaying its tail from side to side in a tremulous manner. Its food consists entirely of insects, procured chiefly while on the wing. The note is clearer than that of the former species, and while uttering it the male frequently erects its lengthened crest feathers.

From Dr. Lonsdale Holden's MS. notes, made principally in North-western Tasmania, I have extracted the following information:—"On the 12th November, 1886, I saw a pair of *Myiagra nitida* in thick scrub in the neighbourhood of Circular Head. The female was building her nest, and I closely watched her for some time. It was on the upper side of a small dead limb in a white gum tree, thirty feet from the ground, and looked like a knot on the branch. The bird utters a note like 'tweet, tweet, tweet,' and the oscillating movement of its tail is frequently seen. I did not get a close view of the male bird. On the 23rd November, I took the nest after four hours' labour and elaborate mechanical preparations. The first seven or eight feet of the branch being sound, I was able with the help of a rope made fast to a branch above, to go out on it far enough to reach the nest with my scoop. It was a round open structure, built across a nearly horizontal branch, and mainly composed of strips of bark, matted together and neatly secured with cobwebs, the lining consisting of a few root-fibres and a little hair; externally it was covered with cobwebs and a few bits of lichen. Outwardly it measures three inches in external diameter, and internally two inches and an eighth in diameter by one inch and three-eighths in depth. It contained three eggs, which I dipped out of the nest with a muslin bag on wire at the end of an eleven feet wand. The nest was so high

from the ground, and projected so far from the other branches, that I could hardly have obtained the eggs in any other manner. On the 25th December, I found another nest in Stony Forest, forty feet from the ground, on the horizontal fork of a small partly dead branch. The female sat at intervals, and both seemed to fly occasionally to the nest and feed young ones. On the 25th October, 1887, three of these beautiful birds visited my garden at Circular Head, two males and a female. They were busily engaged catching insects within a few feet of me." Dr. Holden has also frequently noted these birds for many successive years in different parts of North-western and Southern Tasmania from the middle of October until the second week in March.

In New South Wales, Mr. E. H. Lane found this species breeding at Wambangalang, in November, 1898. The nest was built at the junction of a forked horizontal branch of a stunted gum, about ten feet from the ground. The male was sitting when he first observed it, but fluttered along the ground on his approaching the nest. On returning to the nest some time after, he saw both the male and the female. It contained two eggs, which he reached from his horse while standing in the stirrups.

The eggs are usually three in number for a sitting, oval in form, the shell being close-grained, smooth, and lustrous. They vary in ground colour from dull white to a very faint bluish or greenish-white, and are dotted, spotted, or irregularly marked with brown or pale purplish-brown, and underlying spots of dull purplish-grey, the markings being confined, with the exception of a few straggling spots and dots, to the larger end of the shell, where a more or less well defined zone is formed. In some specimens the pale purplish-brown markings are minutely centred with small purplish-black dots. A set of three, taken on the 23rd November, 1886, by Dr. L. Holden, measures:—Length (A) 0.79×0.6 inches; (B) 0.77×0.59 inches; (C) 0.77×0.58 inches. A set of two, taken by Mr. E. D. Atkinson, in November, 1888, at Table Cape, North-western coast of Tasmania, measure:—(A) 0.78×0.58 inches; (B) 0.77×0.58 inches.

In New South Wales and Tasmania, November and two following months constitute the usual breeding season of this species.

Genus MACHÆORHYNCHUS, Gould.

Machæorhynchus flaviventer.

BOAT-BILLED FLYCATCHER.

Machæorhynchus flaviventer, Gould, Proc. Zool. Soc., 1850, p. 277; *id.*, Bds. Austr., fol., Suppl., pl. 11 (1869).

Machæorhynchus flaviventer, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 390 (1879).

ADULT MALE—*General colour above black: bases of the feathers on the back of a dull olive-green: upper wing-coverts black, the median and greater series broadly tipped with white: primaries and secondaries black, the outer webs and tips of the innermost series margined with white: upper tail-coverts black: tail black, the six central feathers narrowly tipped with white, the remainder largely tipped with white, the outer web of the outermost feather white: feathers in front and below the eye, and the ear-coverts black: a line of feathers extending from the nostril above the eye and on to the sides of the occiput bright yellow: chin and throat white: sides of the neck, all the under surface, and under tail-coverts bright yellow: bill and legs black: iris black. Total length 4.75 inches, wing 2.35, tail 2, bill 0.5, tarsus 0.6.*

ADULT FEMALE—*General colour above olive-green: upper wing-coverts brown the median and greater coverts tipped with white: primaries and secondaries brown, margined externally with olive-green on the basal portion, and white towards the tips: tail feathers blackish-brown, externally*

marginated on their basal half with olive-green, and similarly tipped with white as in the male; fore-head, and a line of feathers extending from the nostril, above the eye, and on to the ear-coverts olive-yellow; feathers in front and below the eye and the ear-coverts blackish-brown; chin, sides of the neck, throat, and fore-neck white; remainder of the under surface pale olive-green, with blackish margins to some of the feathers; centre of the breast whitish, with a slight olive-green tinge; under tail-coverts bright olive-yellow. Total length 5 inches, wing 2.3, tail 2, bill 0.5, tarsus 0.6.

Distribution.—North-eastern Queensland.

THIS species may be readily distinguished from all the Flycatchers found in Australia by its broad and nearly flat boat-shaped bill. It is an inhabitant of the coastal scrubs and table-lands of the contiguous mountain ranges of North-eastern Queensland. Mr. J. A. Thorpe obtained several specimens at Somerset, in 1897-8. During the stay of the "Chevert," Mr. George Masters also procured examples in the same locality. Mr. Frank Hislop informs me that it is not common in the Bloomfield River District, although the birds may be seen both in the scrub and open forest-land, and generally in the breeding season. Messrs. Cairn and Grant, while collecting on behalf of the Trustees of the Australian Museum, in 1888-9, met with it in the scrub near Cairns, and obtained specimens on the tablelands near Peterson's Pocket, on the Upper Barron River; and the late Mr. Edward Spalding obtained both adults and young in the scrub near Cardwell.

Mr. Grant writes: "The Boat-billed Flycatcher was met with in the coastal scrubs near Cairns; but the first specimen we obtained was shot on the table-lands on the Upper Barron River, and others were procured in the scrubs around Boar Pocket. They seem to prefer shady parts of the scrub, but occasionally fly out in the clearings after some passing insect, returning to the same place again after capturing it. They are extremely active and lively in their actions, and generally frequent the scrub or low branches of trees, those we obtained we never saw higher than between twenty and thirty feet from the ground. Their note resembles somewhat that of the Glossy Flycatcher, but is fainter and more plaintive. The stomachs of the specimens we examined contained nothing but insects."

Mr. Bertie L. Jardine has sent me the following notes: "*Macharerhynchus flavicenter* is a resident species in the northern portion of the Cape York Peninsula, where it is almost invariably found in our dense scrubs and thickets. During July, August, and September—its nesting season—the birds become very lively and are constantly on the move, flying from branch to branch, uttering their rather agreeable twittering song. The adult male, like many other birds of bright and attractive plumage, is of a shy disposition, so that it is difficult to get a good look at them owing to the density of the foliage which they are fond of frequenting; but the young males and females are comparatively tame, and specimens of them may easily be obtained."

A nest of this species in the National Museum, Melbourne, found at Cape York, is a very shallow saucer-shaped structure, built in the angle of a thin horizontal forked branch. Outwardly it is constructed of dried flowering plant stalks, matted together with cobwebs, the inner portion consisting entirely of fine dried spiral plant-tendrils. Externally it measures three inches in diameter, by one inch and three-quarters in depth; and internally two inches in diameter by half an inch in depth. Eggs two in number for a sitting, varying from oval to swollen oval in form, the shell being close-grained and its surface smooth and slightly lustrous. They are pure white, and are distinctly dotted and spotted with different shades of purple and red, more particularly on the larger end of the shell, where, in some specimens, the markings assume the form of an ill-defined zone. Length:—(A) 0.66 × 0.52 inches; (B) 0.68 × 0.51 inches.

The eggs of the Boat-billed Flycatcher resemble those of *Ephthianura albifrons*, more than any other species. For an opportunity of examining them, I am indebted to Dr.

Charles Ryan and the late Dr. Charles Snowball, of Melbourne, who kindly permitted me to describe the specimens from their collections.

The two figures given in Gould's "Supplement to the Birds of Australia," are those of adult males.

Fledgelings resemble the adult female, but are browner on the upper parts; the superciliary stripe is duller in colour and almost meets on the occiput; chin and throat white, tinged with yellow; remainder of the under surface pale yellow, becoming slightly brighter on the under tail-coverts. Wing 2·1 inches.

The above described eggs were taken at Cape York in December. Young birds in the collection were procured by Messrs. E. J. Cairn and R. Grant, at Cairns, in November; and fledgelings by the late Mr. E. Spalding, near Cardwell, in October.

Genus MICRÆCA, Gould.

Micræca fascinans.

BROWN FLYCATCHER.

Loria fascinans, Lath., Ind. Orn., Suppl., p. xlv., (1801).

Micræca macroptera, Gould, Bds. Austr., fol., Vol. II., pl. 93 (1848).

Micræca fascinans, Gould, Handbk. Bds. Austr., Vol. I., p. 258 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 123 (1879).

ADULT MALE—*General colour above ashy-brown; upper wing coverts like the back, the greater coverts with whitish margins; quills dark brown, the outer primaries edged externally for three-fourths of their length with brownish-white, the remainder and the secondaries narrowly margined and tipped with white on their outer webs; four central tail feathers blackish-brown, the two outermost on either side white, the remainder blackish-brown, tipped with white; lores and an indistinct eyebrow dull white; chin and throat white; chest pale ashy-brown; remainder of the under surface white; sides of the breast ashy-brown; under tail-coverts white; bill dark brown; legs and feet blackish-brown; iris brown. Total length in the flesh 5·2 inches, wing 3·5, tail 2·3, bill 0·4, tarsus 0·7.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Queensland, New South Wales, Victoria, South Australia.

THE Brown Flycatcher is freely dispersed over most parts of Eastern and South-eastern Australia. It is usually seen in pairs, sometimes high up on the thin dead branches of a lofty giant of the forest, but just as often in lower trees, or on the tops of tree-stumps or fences, frequenting also gardens and orchards close to houses, for it evinces a decided preference for the haunts of man. In New South Wales it is a common and well-known resident, and without exception is the most familiar bird in Sydney and the suburbs, where it may be seen in equal numbers at all seasons of the year. It is a restless little creature, seldom remaining still for any length of time, and even when perched its tail is repeatedly swayed from side to side. During flight the tail is expanded, and the white lateral feathers conspicuously displayed. A favourite resting place of this bird is near the extremity of a thin dead branch; it also clings to the roughened bark of trees, turning its head round and watching an intruder in a similar manner to *Eopsaltria australis*.

Throughout the year the Brown Flycatcher, or "Jacky Winter" as it is locally called in the neighbourhood of Sydney, is the first bird to welcome in with cheerful notes the dawn of day. In early spring it pours forth its sweet and melodious song about 5 a.m.; in the summer months an hour earlier. During these seasons of the year, in addition to its usual notes, it frequently utters clearly and distinctly "pretty, pretty, pretty; you did, you did, you did."

The stillness of early morning is first broken by the rich clear notes of one of these sombre-hued choristers, when it is gradually responded to and taken up by all the Brown Flycatchers in the bush. This opening chorus to the birth of day is kept up for about a quarter of an hour or twenty minutes, then it suddenly ceases, except perhaps for the notes of a far off solitary bird, which sound like an echo in the distance. On bright and clear days in midwinter, this bird also soars about high in the air, until it is almost out of sight, singing sweetly all the time. That the birds of Australia are without song is as erroneous as is the general belief of those who have never been in the Australian bush that its flowers are without perfume.

Its food consists principally of flies, small moths, and butterflies, captured while on the wing, or picked off some tree-trunk while hovering close to it. Small beetles, spiders, and ants, too, are eaten, also the larvæ of insects, and I have often seen it pick up bread-crumbs. In orchards and vineyards it is a most useful bird, being an indefatigable destroyer of insects, and ridding the trees and vines of many pests which infest them.



NEST AND EGGS OF BROWN FLYCATCHER.

Although so dull coloured in plumage, its lively actions, sweet song, and useful habits, will amply repay one for the protection afforded to this ever trustful little bird, when it seeks the haunts of man.

The nest is a small saucer-shaped structure, and would be very difficult to discover, if the actions of the female did not usually betray its whereabouts, for if disturbed she soon returns to the nest, even while one is underneath the tree. It is formed of fine dried grasses, inter-

mingled sometimes with a little horse-hair, and is neatly fitted into the angle of a forked horizontal branch, the rim being raised slightly above the branch, and often ornamented with pieces of bark or bits of lichen, fastened on with cobwebs. Externally it measures two inches, by three-quarters of an inch in depth. Bare dead horizontal branches of the different species of *Eucalyptus*, *Acacia*, and *Melaleuca*, are chiefly selected as nesting-sites, but sometimes low saplings or branches of fallen trees are utilized. In the parks and gardens of Sydney the nest is usually built near the extremity of an outspreading bough of a Moreton Bay Fig. Many thousands of people must have passed under a nest built in a forked horizontal branch of one of the latter trees overhanging a path near the College Street entrance to Hyde Park; yet the birds succeeded in rearing a pair of young ones that more than filled the nest the day prior to leaving it, 24th September, 1901. The site selected generally varies from ten to seventy feet from the ground; but when resorting to fallen trees, nests may be occasionally found very near the ground, or within hand's reach. A nest in the Group collection of the Australian Museum, built in an unusual situation, is in a nearly upright fork of a gum sapling. This nest, which is partially lined with white fowl's feathers, I found at Chatswood on the 22nd August, 1897. It contained two heavily incubated eggs. The nest figured was built in a tea-tree, at Canterbury.

The eggs are usually two, rarely three in number for a sitting, and vary considerably in shape, size, and disposition of their markings. Ovals are most common, but elongate-ovals and ellipses in form are not infrequently found, the shell being close-grained and its surface dull and lustreless. They are of a pale greenish-blue ground colour, which is freckled, spotted, and blotched with purplish-brown, intermingled with similar underlying markings of greyish-lilac. All the markings are irregularly shaped, in some specimens they are evenly distributed over the shell, in others they predominate on the larger end and there form a cap, or a more or less well-defined zone. An unusually marked set of two I have before me is longitudinally streaked, particularly on the larger end, with very pale purplish and umber-brown, intermingled with similar underlying streaks and a few freckles of dull greyish-lilac; the markings on this set resemble in character those on the eggs of the different species of Rifle-birds. When fresh, the eggs of the Brown Flycatcher become more beautiful and richer in ground colour directly they are blown, but they soon commence to fade when perfectly dry, and in a few weeks the ground colour is as pale as when first found, with the neutralising tint of the yolk showing

through the semi-transparent shell. A normal sized set of three, taken at Canterbury, near Sydney, measures as follows:—Length (A) 0.8×0.58 inches; (B) 0.78×0.57 inches; (C) 0.79×0.56 inches. An elongate set of two, taken in the same district, measures:—(A) 0.85×0.53 inches; (B) 0.84×0.54 inches. A set of two, taken at Chatswood, measures:—(A) 0.76×0.57 inches; (B) 0.75×0.58 inches.



BROWN FLYCATCHERS (NESTLINGS.)

the bird flew on to the nest and turned the egg out with her bill. It fell over twenty feet on to a mass of maiden-hair fern, without breaking, and is now a perfect specimen in my collection."

Nestlings are blackish-brown above, each feather having a sagittate marking of brownish-white at the tip; lesser and median upper wing-coverts like the back; the greater series brown tipped with pale brown; primaries and secondaries dark brown, externally margined and tipped with pale brown; a spot in front of the eye blackish; all the under surface white, the feathers of the fore-neck and breast having a spot of blackish-brown towards the tip; under tail-coverts white; bill greyish-black; gape yellow; legs and feet fleshy-grey; iris blackish-brown. Wing 1.8 inches. The nestlings figured were taken at Chatswood on the 31st October, 1901, from a nest in a Rough-barked Apple-tree. On the following day they were photographed at the Australian Museum, and I returned them to their anxious parents the same afternoon.

Young birds are similar, but have the sagittate markings on the upper parts smaller, lores blackish, and the feathers on the fore-neck and sides of the breast more distinctly spotted with blackish-brown. Wing 3.2 inches.

Dr. W. Macgillivray writes me:—"I have taken nests of *Micræca fascians*, with eggs early in January. On one occasion, when climbing to one of their nests, when I was quite near it

August and the four following months constitute the usual breeding season, but I have known of several nests being found with eggs in July, and I have seen young birds that had not long left the nest being fed by their parents as late as the 6th of February. Two broods are reared during the season, but a fresh nest is built for each brood. Only on one occasion have I known this species to deposit its eggs in the same nest in the following season.

At Belmore, near Sydney, a nest of this species was found containing two eggs, also the egg of the Bronze Cuckoo (*Lamprolaima placens*). Mr. G. A. Kearland informs me that the egg of the Square-tailed Cuckoo (*Cacomantis variolosus*) has been taken from a nest of this species in Victoria.

In the trees surrounding my house at Roseville, I observed during the first week in February, 1903, a pair of Brown Flycatchers assiduously attending to the wants of a young Pallid Cuckoo. The wearisome cries of the latter as it followed its diminutive foster parents for food, continued with but short intervals from early morning until long after sunset. In the same paddock, a pair of Black and White Fantails was simultaneously engaged in satisfying the cravings of another young Pallid Cuckoo.

Microeca pallida.

PALLID FLYCATCHER.

Microeca pallida, De Vis, Proc. Roy. Soc. Queensld., Vol. I., p. 159 (1884); North, Rec. Austr. Mus., Vol. III., p. 107 (1899).

Microeca assimilis, (nec Gould), Ramsay, Proc. Linn. Soc. N.S.W., 2nd ser., Vol. I., p. 1089 (1886).

Microeca fascians, (nec Lath.), Kearl., Proc. Roy. Soc. South Austr., Vol. XXII., p. 174 (1898).

ADULT MALE—General colour above pale ashy-brown; upper tail-coverts blackish-brown; lesser and median coverts like the back; the greater series brown, with indistinct whitish margins; quills dark brown, the primaries narrowly edged externally for three-fourths of their length and tipped with white; the secondaries margined and tipped with white; two outermost tail feathers on either side white; the next white, blackish-brown at the base; the remainder blackish-brown, tipped with white, the tips decreasing in size towards the central pair, which are entirely blackish-brown; lores and an indistinct eyebrow dull white; all the under surface white, tinged with pale ashy-brown on the chest and sides of the body; under tail coverts white; bill dark brown; base of the lower mandible pale brown; legs and feet blackish-brown. Total length 4.3 inches, wing 3, tail 2, bill 0.3, tarsus 0.6.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Northern Queensland. North-western Australia.

THE Pallid Flycatcher is the representative in the northern portions of the continent of the preceding species *Microeca fascians*, from which it may be easily recognised by its much smaller size and paler colour. It was discovered by Mr. Kendal Broadbent in July, 1883, during a visit to Kimberley, at the mouth of the Norman River, where it enters the Gulf of Carpentaria. Specimens were also obtained by Mr. E. J. Cairn, while collecting on behalf of the Trustees of the Australian Museum, at Derby, North-western Australia, in 1886. Mr. De Vis has, with his usual promptitude, kindly favoured me with the loan of typical specimens for examination. They are similar to the examples from Derby. As in *M. fascians*, there is a variation in the extent of white on the wings and tail; in one specimen the three outermost tail feathers on either side are pure white; an example from Derby has also a dull whitish frontal streak. The wing measurement varies from 2.95 to 3.2 inches.

Dr. W. Macgillivray kindly forwarded me the following description of the nest of this species, together with the eggs, and a skin of the bird for identification:—"Two nests of this species of *Micræca* were taken by my brother, Mr. A. S. Macgillivray, on Leilavale Station, Fullerton River, North Queensland, between the 20th and 26th December, 1897. They were built rather low down, on horizontal branches in a patch of Gidgee (*Acacia homalophylla*) scrub. A nest my brother sent was slightly smaller, but more substantially built than that of *Micræca fascians*, and of much the same material, the outside being ornamented with bits of bark and lichen attached by means of cobweb." The eggs, two in number, are oval in form, the shell being close-grained, smooth, and lustreless. One specimen is of a pale bluish-grey ground colour, which is freckled and spotted with faint purple and purplish-brown, predominating and becoming darker as usual on the thicker end of the shell; the other is of a warm stone-white ground colour, and in many places the markings, which are of a light reddish-purple are confluent, and intermingled with faint underlying spots of greyish-lilac. Length (A) 0.69 × 0.53 inches; (B) 0.67 × 0.56 inches.

Although I have never seen any specimens from the Northern Territory of South Australia, the range of this species, like many others common to the Gulf District of Northern Queensland, and the Derby District of North-western Australia, doubtless extends right across the northern portion of the continent.

***Micræca flaviventris*.**

YELLOW-BELLIED FLYCATCHER.

Micræca flavigaster, Gould, Proc. Zool. Soc., 1842, p. 132; *id.*, Bds. Austr., fol., Vol. II., pl. 94 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 261 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 126 (1879).

Micræca flaviventris, Salvad., Ann. Mus. Civ. Gen., Vol. XII., p. 324 (nom. emend.); *id.*, Orn. Pap. et Molucc., Pt. II., p. 93 (1881).

ADULT MALE—*General colour above olive-brown, slightly darker brown on the head and a clearer olive on the rump and upper tail-coverts; lesser and median upper wing-coverts like the back; the greater coverts brown, margined with olive-brown; quills brown, externally edged with olive brown; tail feathers brown, margined externally with olive-brown, the inner webs of the lateral feathers indistinctly tipped with white; chin and throat dull white; remainder of the under surface yellow; the sides of the breast olive-brown; under tail-coverts yellow; bill brown, the base of the lower mandible yellowish-brown; legs and feet grey; iris dark brown. Total length 4.8 inches, wing 3, tail 2.2, bill 0.37, tarsus 0.55.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Northern Territory of South Australia. Northern and North-eastern Queensland, New Guinea.

THE Yellow-bellied Flycatcher inhabits the northern and north-eastern portions of the continent. The late Mr. E. Spalding obtained specimens in the mangroves near Port Darwin, and numerous examples have been procured by various collectors on the north-eastern coast of Queensland, from Cape York south to the Herbert River.

The wing measurement of adult birds, obtained in the neighbourhood of Cardwell, varies from 2.95 to 3.3 inches.

Mr. Frank Hislop writes me:—"In the Bloomfield River District, North-eastern Queensland, the Yellow-bellied Flycatcher is only seen in the open forest land. It builds chiefly in a horizontal fork of a thin dead branch, but not infrequently the nest is placed on the end of a broken off upright limb which is about the same size as the structure itself. It is the smallest

nest I have seen, measuring barely one inch and a half across, and is outwardly constructed of small pieces of Bloodwood bark, held together with spider's web, the inside being neatly lined with tea-tree bark. Only one egg is laid for a sitting. When we were living at 'Wyalla,' a pair used to nest regularly in a Moreton Bay Ash, close to our house. This species usually commences to breed in November."

A nest of this species now before me, taken near Cooktown, on the 2nd January, 1900, is built in the angle of a partially upright thin forked branch. It is a small shallow cup-shaped structure, formed chiefly of fine strips and scales of bark, intermingled with a few short bits of dried grass, and held together with spiders' webs; the rim, which is thick and rounded, and the outer portion of the nest being covered with the latter material. Inside, it has no special lining at the bottom, and to the exposed portions of the sides are attached several large pieces of the white paper-like bark of a *Melaleuca*. Externally it measures one inch and three-quarters in diameter, and its greatest depth one inch, the inner cup measuring one inch and an eighth in diameter by half an inch in depth. The single egg it contained, which occupied nearly all the available space inside the nest is oval in form, the shell being close-grained and its surface dull and lustreless, the ground colour being of a very faint blue over which is evenly distributed minute dots of pale purplish-red. Length: 0.72×0.53 inches.

Genus **MONARCHA**, Vigors & Horsfield.

Monarcha melanopsis.

BLACK-FACED FLYCATCHER.

Muscicapula melanopsis, Vieill., Nouv. Dict. d'Hist. Nat., tom. XXI., p. 450 (1818).

Monarcha carinata, Gould, Bds. Austr., fol., Vol. II., pl. 95 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 262 (1865).

Monarcha melanopsis, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 430 (1879); Salvad., Orn. Pap. et Moluca, Pt. II., p. 17 (1881).

ADULT MALE.—*General colour above grey: upper wing-coverts like the back; quills dark brown, externally margined with grey on their outer webs; tail feathers dark brown washed with grey; a ring of feathers round the eye, band on the forehead, and lores black; feathers in front of the eye ashy-white; chin and throat black; sides of the neck and the chest grey; remainder of the under surface and under tail-coverts orange-buff; bill bluish-grey, paler at the tip; legs and feet bluish-lead colour; iris black. Total length in the flesh 7 inches, wing 3.55, tail 2.9, bill 0.6, tarsus 0.75.*

ADULT FEMALE.—*Similar to the male in plumage.*

Distribution.—Eastern Queensland, Eastern New South Wales, Eastern Victoria, New Guinea.

THE range of the Black-faced Flycatcher extends throughout the greater portion of the coastal districts of Eastern Australia, and South-eastern New Guinea. Temminck states it has also been obtained in Timor. In North-eastern Queensland it is sparingly distributed throughout the coastal scrubs and contiguous mountain ranges, but few specimens being obtained near Cairns by Messrs. Cairn and Grant during their collecting expedition on behalf of the Trustees of the Australian Museum. Examples from this district have slightly narrower bills and the sides of the head are paler, and they are almost intermediate in colour between *Monarcha melanopsis* and the northern race *M. canescens*, inhabiting the Cape York Peninsula. Further south, in Queensland, it is more freely distributed in favourable situations, and it is common in the coastal scrubs and mountain ranges of Eastern New

South Wales, being found as far inland as the western slopes of the Blue Mountains; it is tolerably numerous in favourable situations throughout the Illawarra District, its range also extending, but in diminished numbers, into the eastern parts of Victoria where a similar flora exists.

Individual variation exists in the width of the bill and the extent of the black marking on the face and throat of *Monarchia melanopsis*, the latter being smaller in young birds, and gradually increasing in size until fully adult. In a very old male, obtained by Mr. R. Grant in the Bellinger River District, the feathers above the eye and the crown of the head are black; the lower portion of the black marking on the throat extends on to the sides of the neck, and the grey feathers on the centre of the chest are mottled with black, which colour also extends on to some of the orange-buff feathers on the upper portion of the breast. The upper figure of this species in Gould's folio edition of the "Birds of Australia," is that of an immature bird. When

fully adult, both sexes have the black face and throat, and are indistinguishable from one another except by dissection.

During the breeding season, it is usually met with singly or in pairs, in damp gullies or on the brush-covered margins of creeks and rivers, particularly where there is a luxuriant vegetation and tree ferns and palms abound. At Ourimbah, I have frequently observed it bathing in a creek. Near Sydney it may be occasionally observed in open forest or lightly timbered lands from the beginning of February until the end of September. It is not common, however, and retires from the



NEST AND EGGS OF BLACK-FACED FLYCATCHER.

vicinity of the metropolis to breed in the more secluded mountain gullies of the county.

The spring notes of this species are remarkably rich and clear, and somewhat resemble "why-yew witch-yew," each note being uttered slowly and distinctly and repeated several times. I have never heard it call during winter.

Its food consists entirely of insects of various kinds, which it picks off in an unobtrusive manner from the stems and branches of trees. At Roseville I saw one of these birds capture a very large moth, which it swallowed entire.

The nests of this species vary in shape according to the position in which they are built. When placed at the junction of a thin forked horizontal branch they are cup-shaped in form, but when built in upright forked branches they are of an inverted cone or pear-shape with a cup-like cavity at the top, the bottom tapering more or less to a point according to the thickness of the fork in which it is placed. The latter type is far more common, and resembles in shape

the well-known nest of *Falcunculus frontatus*. The nest is usually formed throughout of *Casuarina* leaves, and is thickly coated externally with bright green moss, the inside being sometimes lined with fine black hair-like rootlets. An average cup-shaped nest measures externally four inches in diameter by three inches and a half in height, the inner cup measuring two inches and a half in diameter by one inch and a half in depth. A beautiful nest of this species, found at Ourimbah on the 24th November, 1890, measures externally three inches and a half in diameter by four inches and a half in height, the inner cup measuring two inches and a half in diameter by one inch and a half in depth. It was built in and around an upright fork, near the leafy top of a low tree, about fifteen feet from the ground, and the female was sitting on two fresh eggs. Some nests are built on horizontal branches, where several thin leafy twigs grow out at either side. This species is not particular in the kind of tree selected as a nesting-site, but usually the nest is more or less sheltered or partially concealed with leaves. I have seen them built at heights varying from three to thirty-five feet from the ground.

Of seven nests I found at Ourimbah during November, 1901, six were built in and around upright forks, and only one on a horizontal branch. One very pretty nest was built on a leaning branch of a Coachwood, growing through the frond of a Bangalow palm on the edge of a creek. From this nest Mr. D. Swift successfully scooped two incubated eggs. Fresh eggs were also taken the same day from two more nests—one in a Sassafras, the other in a Maiden's Blush tree. Large leaved trees are, as a rule, favoured by this species for nesting in. While sitting, the black throat of the female shows very conspicuously over the side of the nest. When so engaged, the male is generally perched in a tree close by, enlivening his consort with his rich and clear notes.

The nest and set of three eggs figured, were taken by Mr. R. J. Etheridge on the 14th November, 1897, in a deep mountain gully at Colo Vale. Externally the nest measures three inches and a half in diameter by three inches in height; internally two inches and a quarter in diameter by one inch and a half in depth.

The eggs are usually two, rarely three in number for a sitting, and oval or elongate oval in form, some specimens being compressed towards the smaller end, others somewhat sharply pointed at each end; the shell is close-grained, smooth, and lustreless. They vary in ground colour from pure white to a faint reddish-white, which is minutely dotted and spotted with bright red, with which are sometimes intermingled a few underlying spots of dull reddish or purplish-grey. Some specimens are uniformly marked all over, almost obscuring the ground colour; others are more or less distinctly zoned on the larger end, and but sparingly marked on the remainder of the shell. Of a set of two, taken by me at Ourimbah on the 25th November, 1899, one egg is pure white with a broad band of confluent rich red dots and spots on the larger end; the other is of a faint reddish-white, minutely dusted and finely freckled all over with purplish-red, the markings being more thickly disposed on one side, and where on the larger end is a broad confluent patch of rich purplish-red. Length:—(A) 0.97×0.67 inches; (B) 0.93×0.67 inches. A set of three in Mr. R. J. Etheridge's collection, taken at Colo Vale, measures:—Length (A) 0.86×0.69 inches; (B) 0.9×0.69 inches; (C) 0.9×0.67 inches.

This species is a late breeder, nests with fresh eggs being usually found in November and December, and as late as the middle of January.

Immature birds resemble the adults, but are destitute of the narrow ring of black feathers round the eye, and the face and throat are grey like the head and neck.

Monarcha gouldi.

BLACK-FRONTED FLYCATCHER.

Monarcha trivirgata, (nec Temm.), Gould, Bds. Austr., fol., Vol. II., pl. 96 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 263 (1865).

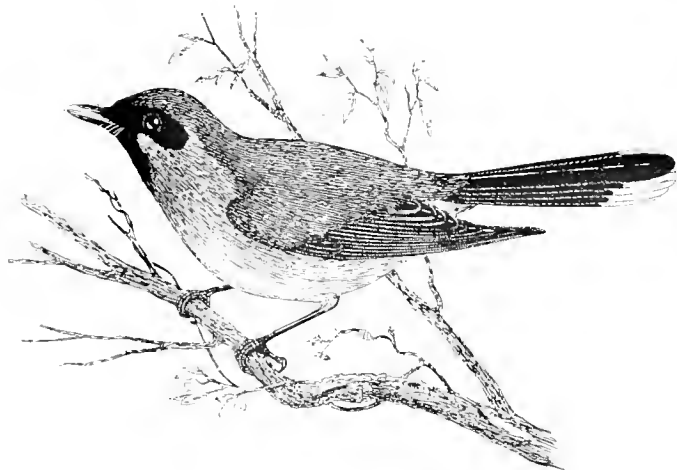
Monarcha gouldi, Gray, Proc. Zool. Soc., 1860, p. 352.

Piezorhynchus gouldi, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 419 (1879) (part).

ADULT MALE.—General colour above dark grey; upper wing-coverts like the back; primaries and secondaries brown, margined with dull grey on their outer webs; tail black, the three outermost feathers tipped with white; forehead, lores, a narrow line of feathers above and below the eye, and the ear-coverts black; chin and centre of the throat black; sides of the throat, fore-neck, chest, and sides of the body orange-rufous; centre of the breast, abdomen, and under tail-coverts white; bill bluish-grey, paler at the tip; legs and feet bluish-lead colour; iris black. Total length 6 inches, wing 3.1, tail 2.8, bill 0.42, tarsus 0.7.

ADULT FEMALE.—Similar in plumage to the male.

Distribution.—Eastern Queensland, Eastern New South Wales.



BLACK-FRONTED FLYCATCHER.

THE range of this species extends throughout the greater portion of Eastern Queensland and North-eastern New South Wales. It is closely allied to *Monarcha trivirgata* of Timor, under which name Gould figures and describes it in his "Birds of Australia." Gray, however, in the "Proceedings of the Zoological Society of London," pointed out that the Timor bird has a larger bill, that the three outer tail-feathers are more largely tipped with white, and also that the fourth has a spot of white at the tip of the outer web,

and he proposed the name of *Monarcha gouldi* for the Australian bird. Individual variation exists in the depth of colour on the breast and the extent of the black marking on the face, even when procured in the same locality. In some specimens, too, the upper tail-coverts are blackish, although as a rule they are grey. An example obtained near Cairns, North-eastern Queensland, has the three outer tail-feathers tipped with white, and there is a spot of white at the tip of the outer web of the fourth feather on one side only. Specimens from North-eastern Queensland have the orange-buff chest, breast, and sides of the body of a much richer tint than others procured in New South Wales.

Numerous specimens of *Monarcha gouldi* were obtained by Messrs. Cairn and Grant in the scrub near Cairns, and Mr. G. Masters procured examples at Wide Bay. It is also common in the northern coastal brushes of New South Wales, although it is not so frequently seen in winter. On the Upper Clarence River, in November, 1898, I observed it kept always to the scrubs and gullies, and never ventured into the open forest lands. I found a partially built nest in the fork of a vine, and Mr. G. Savidge had taken a very pretty nest containing eggs, built in a similar situation, just before my arrival. At Ourimbah, which is the furthest south I have known this species to occur, a pair were nesting in November, 1901, and I frequently saw them bathing in a creek.

The nest is a deep cup-shaped structure, formed of thin strips of bark, held together with spider's web, the inside being usually lined with fine black hair-like rootlets, and the exterior thinly coated with green mosses, and ornamented with the silky covering and egg-bags of spiders. As a rule the latter decorations are pure white, but in several nests I have seen they were bright green, or the two colours were intermingled together. Some nests from the Upper Clarence District are lined with fine dried grass stems. The shape of the nest varies according to the angle of the fork in which it is built: those in wide forks being cup-shaped in form, while those in narrow forks are built up a sufficient height to accommodate the sitting bird, and resemble an inverted cone. An average nest measures externally three inches and a half in diameter by two inches and three-quarters in depth, and the inner cup two inches in diameter by one inch and three-quarters in depth. They are usually built in the upright fork of a low tree, or in the fork of a hanging vine, at a height varying from three to twenty feet from the ground.

The eggs are two in number for a sitting, and vary in form from oval to elongate-oval, the shell being close-grained and its surface dull and lustreless. They are of a dull or creamy-white ground colour, thickly dotted and spotted with bright red or reddish-brown, some specimens being uniformly marked over the surface of the shell and almost obscuring the ground colour, others being more sparingly marked on the smaller end and having an irregular zone or cap of spots on the larger end, and occasionally specimens are found with a few underlying dots and spots of reddish-grey. A set of two, taken in October, 1898, in Hackett's Scrub, near Copmanhurst, on the Clarence River, measures as follows: Length (A) 0.82×0.6 inches; (B) 0.81×0.6 inches. Another set of two, from the same locality, measures:—(A) 0.87×0.61 inches; (B) 0.84×0.63 inches.

In the Upper Clarence River District, Mr. G. Savidge informs me that this bird is a migrant and commences to build soon after its arrival about the middle of September. One nest he found built in the fork of a hanging vine, twelve feet from the ground, and from which two eggs were taken at the end of October, 1898, took the birds six weeks to construct. The eggs are deposited on successive days, and Mr. Savidge has found them as late as the 6th January, and noted one year the species still frequenting the district at the beginning of May.

Monarcha albiventris.

WHITE-BELLIED FLYCATCHER.

Monarcha albiventris, Gould, Proc. Zool. Soc., 1866, p. 217; *id.*, Bds. Austr., Suppl., fol., pl. 13 (1869).

Piezorhynchus albiventris, Sharpe, Rep. Voy. "Alert," p. 15, 1884.

ADULT MALE—*Like the adult male of MONARCHA GOULDI, but having the upper tail-coverts blackish, and the lower portion of the breast and the sides of the body pure white. Total length 5.5 inches, wing 2.9, tail 2.7, bill 0.4, tarsus 0.7.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Cape York Peninsula, Islands of Torres Straits.

ALTHOUGH undoubtedly closely allied to *Monarcha gouldi*, the present species may be easily distinguished by having the lower portion of the breast and sides of the body pure white. In the "Catalogue of Birds in the British Museum," Dr. Sharpe places *M. albiventris* as a synonym of *M. gouldi*, but later on, in the "Report of the Voyage of H.M.S. Alert,"† states that he believes he was wrong in doing so, and there admits the validity of this species.

* Cat. Bds. Brit. Mus., Vol. iv., p. 419 (1879).

† Rep. Zool. Coll. H.M.S. "Alert," p. 15 (1884).

The type of this species, collected at Cape York by Mr. Jardine, formed part of a small collection of birds received by Gould from his brother-in-law, the late Mr. Charles Coxen, of Brisbane. Mr. George Masters states that it is common at Cape York and on the islands of Torres Strait. During the voyage of the "Chevert," (undertaken by the late Sir William Macleay), three males, three females, and five young birds in different stages of plumage, were obtained at Cape York; and other specimens were procured at Cape Grenville, Darnley Island, and Sue or Warrior Island, and one specimen was obtained as far south as the Endeavour River.

The eggs of this northern species are two in number for a sitting, and are indistinguishable from those of its close ally *M. gouldi*, except for their slightly smaller size. Two sets, taken at Cape York in December, 1899, are of a dull white ground colour, one set being uniformly marked all over with dots and spots of bright reddish-brown, the other having a zone of rich red spots on the larger end, and minutely freckled with the same colour over the remainder of the shell. The former set measures as follows:—Length (A) 0.8×0.57 inches; (B) 0.78×0.57 inches. The latter set measures:—(A) 0.81×0.56 inches; (B) 0.82×0.58 inches.

Young birds resemble the adults, but have the head uniform in colour with the back, the forehead washed with rufous, and the throat grey.

Genus ERYTHRODRYAS, Gould.

Erythrodryas rosea.

ROSE-BREASTED ROBIN.

Petroica rosea, Gould, Proc. Zool. Soc., 1839, p. 112.

Erythrodryas rosea, Gould, Bds. Austr., fol., Vol. III., pl. 2 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 277 (1865); North, Vict. Nat., Vol. XII., p. 137 (1896).

Petroica rosea, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 170 (1879).

ADULT MALE—General colour above dark slaty-grey; lesser wing-coverts like the back; median and greater coverts and the quills dark brown, the inner secondaries washed with slaty-grey on their outer webs; tail blackish-brown, the three feathers largely tipped with white on their inner webs, which increases in extent towards the outermost; on the forehead a small white spot; sides of the head dark slaty-grey, the throat paler; fore-neck and breast rose-red; abdomen and under tail-coverts white; bill dark brown, base of the lower mandible yellowish-horn colour; legs dark fleshy-brown; iris dark brown. Total length in the flesh 4.10 inches, wing 2.7, tail 2.4, bill 0.32, tarsus 0.6.

ADULT FEMALE—Above dark ashy-brown; quills brown, crossed with a whitish band, and externally edged with dull white on the apical portion of their outer webs; tail dark brown, and similarly marked with white as in the male; spot on the forehead buff; all the under surface dull greyish-white, lighter on the throat and abdomen; the fore-neck and breast washed with rose-pink, and the flanks with brown; under tail-coverts dull white.

Distribution.—Queensland, New South Wales, Victoria.

THE Rose-breasted Robin, although by no means common, is distributed in favourable situations throughout the greater portion of South-eastern Queensland, the whole of the coastal brushes and contiguous mountain ranges of Eastern New South Wales, and the humid scrubs of Eastern and Southern Victoria. During the winter months it chiefly frequents the open forest lands, and retires again in the spring to its thickly-wooded retreats for the purposes of breeding. Near Sydney it is usually met with singly or in pairs, and is so familiar that I have often observed it in the suburban gardens on the outskirts of Ashfield

and Croydon, its range extending inland to the western slopes of the Blue Mountains. In Victoria, it is found as far east as the Otway forest, and it is freely dispersed throughout the Dandenong Ranges, within twenty miles of Melbourne, where its nests are not uncommon.

This species has a weak piping little note, difficult to syllabicate, but when once heard it is sufficient to distinguish it from that of any other Robin. Its food consists principally of small moths and their larvæ.

Nests of this species were obtained at Cambewarra, in the Illawarra district of New South Wales, by Mr. J. A. Thorpe, the Taxidermist of the Australian Museum. Although the birds were in both instances seen and obtained near the nests, unfortunately neither of the latter contained eggs. Subsequently Mr. J. Gabriel kindly sent me the birds, nests, and eggs procured by him at Bayswater, Victoria; also the following notes, under date 28th December, 1895:—“My first nest of *Erythrodryas rosea* was found in a Blackwood Tree (*Acacia melanoxylon*), in November, 1893, and contained three hard set eggs; the second and third nests on 18th December of the same year, both containing fresh eggs; also a nest in a Hazel Tree (*Pomaderris apetala*), with young; and the fifth nest in a Blanket Tree (*Senecio bedfordi*), with three eggs, on 18th November, 1894. About a dozen old nests were found in Hazel, Blanket, Blackwood, and Native Holly trees. The last clutch, the one which I am sending you with nest—oh, what a pretty one!—you will see is on a Musk Tree (*Aster argophylla*), and was about twenty feet from the ground. These birds build at a height varying from twelve to sixty feet. The nesting season is November, December, and January; the second nest enclosed, which we found yesterday (27th December, 1895), being an unfinished nest, and pointing to the latter month. Like the Flycatchers, they are continually on the move, and the note is merely an apology for a noise.”

Writing under date 30th October, 1898, Mr. Gabriel remarks: “I cannot add much to my former note on *Erythrodryas rosea*, except that my last two sets of eggs were taken under considerable difficulty. The birds had chosen two tall Hazel trees in which to build their nests. As each tree was of doubtful age and strength, four of us supported the upper part of it with tall forked branches; in the meantime the butt of the tree was chopped through, and three or four feet of it was cut off at a time, until we gradually reached the nest. Our work was rewarded by two sets of eggs of two and three respectively; on the set of two the female sat until we got too close. On another occasion six of us cut down a heavy Blanket tree, as above, and the nest was empty, although we saw the bird fly off before commencing our work.”

The nest of this species is a beautiful structure, and closely resembles that of its congener, *Erythrodryas rhodinogaster*. The one sent by Mr. Gabriel, which contained two eggs, is built at the junction of a forked horizontal branch of *Aster argophylla*, from which spring two thin curved branches, protecting the sides of the nest and sheltering it above with their leafy sprays and clusters of flowers. It is cup-shaped, and outwardly composed of a green *Hypnum*, held together with a fine network of cobwebs, and ornamented with pieces of apple-green lichen; inside it is warmly lined with opossum fur and the down from the freshly budded fronds of a tree fern. Exteriously it measures 2·5 inches in height and breadth, and internally 1·5 inch in diameter by 1·1 inch in depth. The rim, which is thick and rounded, is ornamented with lichens, and measures 0·6 inch in width. This nest is figured on Plate A. 2. The unfinished nest, which was placed on a thick horizontal branch, is similarly formed, but has no lining of opossum fur. The nests found by Mr. Thorpe at Cambewarra are more thickly covered with lichens—in fact, one nest, until closely looked at, appears to be wholly constructed on the exterior with this pretty and much-used nest decoration.

During a visit to Ourimbah, in company with Mr. D. Swift, the latter found a beautiful nest of this species in a Sassafras (*Doryphora sassafras*) on the 11th November, 1901. It was built on a horizontal limb at a height of thirty-five feet from the ground, and the female was

sitting on two fresh eggs. This nest, which is now mounted in the Group collection of the Australian Museum, is broader at the base where it is saddled on to the limb, than at the top. Externally it measures at the base three inches and three-quarters in diameter, and across the top two inches and a quarter, the inner cup measuring one inch and a quarter in depth. On the same day I found another new nest lying on the ground, and apparently blown off by the high winds of a few days before.

The eggs are oval in form, the shell being close-grained, smooth, and lustreless. They are of a very faint greenish or bluish-grey ground colour, and are minutely dotted and spotted with purplish-brown, dark slaty-brown, and wood-brown markings, which become larger on the thicker end, and form an ill-defined zone. Length:—(A) 0.7×0.53 inches; (B) 0.69×0.53 inches. A set of three eggs taken by Mr. Gabriel at Bayswater, on the 11th December, 1897, from a nest built in a Blanket tree, and which also contained an egg of the Square-tailed Cuckoo, measures as follows:—Length (A) 0.61×0.5 inches; (B) 0.61×0.5 inches; (C) 0.61×0.51 inches. A set of two, taken by Mr. D. Swift at Ourimbah, on the 11th November, 1901, measures: Length (A) 0.69×0.52 inches; (B) 0.67×0.53 inches.

Erythrodryas rhodinogaster.

PINK-BREASTED ROBIN

Saricola rhodinogastra, Drapiez, Ann. Gén. Des. Sci. Phys. Bruxelles, Tom. II., p. 340 (1819).

Erythrodryas rhodinogaster, Gould, Bds. Austr., fol., Vol. III., pl. 1 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 276 (1865).

Petrarca rhodinogastra, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 170 (1879).

ADULT MALE—General colour above slaty-black; lesser and median wing coverts like the back, the greater series blackish-brown; quills blackish-brown, the secondaries with a large white spot at the base of the inner webs, and a small indistinct buffy-brown spot near the centre of the outer web, and another near the tip, these spots also extending on to the inner primaries; tail feathers blackish-brown, externally margined with slaty-black; a small spot on the forehead white; sides of the head and throat slaty-black; remainder of the under surface rose-pink; vent and under tail coverts white; bill black, yellowish horn-colour at the base of the lower mandible in some specimens; legs and feet blackish-brown, soles of feet ochraceous; iris black. Total length in the flesh 5.2 inches, wing 2.7, tail 2.2, bill 0.55, tarsus 0.8.

ADULT FEMALE—General colour above olive-brown; lesser and median wing-coverts like the back, the greater series dark brown, slightly washed with olive; quills dark brown, crossed on their outer webs with two conspicuous bands of rich buff, the secondaries having a large spot of white near the base of their inner webs; tail dark brown, the lateral feathers paler, a small spot on the forehead white; all the under surface pale brown, the flanks slightly tinged with olive; centre of the abdomen and under tail-coverts dull white, tinged with buff.

Distribution.—Victoria, South Australia, Tasmania.

THE Pink-breasted Robin is an inhabitant of the humid mountain ranges and gullies of Eastern and Southern Victoria, South Australia, and Tasmania. It is more freely distributed over the latter island, specimens in the collection being obtained by Mr. George Masters at Brown's River. Several beautiful specimens have also been received in the flesh from Mr. E. D. Atkinson of Waratah, Mount Bischoff. I first observed this species in the moist scrubs and fern gullies of South Gippsland, my attention being directed to it by its low monotonous note. This note, which is easily imitated, closely resembles "tick, tick, tick," and enables one to allure any birds within call in the vicinity in which it is uttered. Usually it

was met with in isolated pairs, near tracks in the densest part of the scrub; and during my many visits to that district, it was never observed in the gardens or clearings around the houses. Its food consists principally of small insects and their larvæ. Dr. L. Holden states in his MS. notes that he has frequently observed this species in different parts of the north-western coast of Tasmania, sometimes in the depths of the forest, occasionally in low gum trees on the road-side, and once in a garden at Stanley. The latter, a fine old male, was very tame, and had been about there several days, picking up insects, worms, etc. Near Hobart, he has often noted them in the upper forest on Mount Wellington, and also at the foot of the falls of the creek which gives its name to the Russell's Falls River.

Dr. A. M. Morgan informs me that he has observed this species in the Mount Lofty Ranges, near Adelaide, in most seasons of the year, and that he has seen immature birds, and heard of its nest being taken, although he had never taken it himself.

A nest of this species, received from Mr. E. D. Atkinson, and taken by Mr. George Hinsby, near Hobart, on the 22nd October, 1888, is a very neat and beautiful cup-shaped structure, outwardly composed of green moss and spiders' webs, and is lined inside with the down from the freshly budded fronds of the tree fern. The rim is thick and rounded, and the whole exterior is profusely decorated with pale green lichens. It measures externally two inches and three-quarters in diameter by two inches and a half in depth. This nest was built at the junction of a horizontal forked branch of a *Leptospermum*, at a height of ten feet from the ground. The tree was near the roadside at the head of Kangaroo Valley, under Mount Wellington. The female was sitting, and the nest contained three fresh eggs. I received a similar nest, built on the top of a moss-grown horizontal fork, from Mr. E. Pakenham while at Childers, South Gippsland. It was built in a Musk (*Aster argophylla*), growing in a fern gully near his house, and it contained a single fresh egg.

One of the most beautiful specimens of bird architecture I have seen is a nest of this species in the Group collection of the Australian Museum. Externally it measures two inches and three-quarters in diameter by two inches and a half in depth; the inner cup, which is chiefly lined with opossum fur, measuring two inches in diameter by one inch and a quarter in depth. It was procured by Mr. Atkinson and his son at Waratah, Mount Bischoff, on the 22nd November, 1902, when it contained three fresh eggs.

The eggs are three in number for a sitting, and are rounded oval in form, the shell being close-grained, and its surface smooth and lustreless. The ground colour is of a dull greenish-white, which is minutely dotted and spotted with pale or yellowish-brown, more particularly on the thicker end, where the markings are larger and intermingled with faint underlying spots of lilac-grey. Others have the markings richer and darker, but as a rule the outer ones are of a shade of brown, and the underlying ones of a lilac or purplish-grey. Whether large or small they are all of irregular shape, and predominate on the thicker end, where in some specimens a more or less well defined zone is formed. Some eggs, although differing in the tint of ground colour, bear a resemblance in the colour and character of their markings to those of *Rhipidura albiscapa*, but are of course much larger. Two eggs of a set of three, taken at Mount Wellington, Tasmania, in October, 1888, measure:—Length (A) 0.65 × 0.56 inches; (B) 0.66 × 0.55 inches.

October and the three following months constitute the usual breeding season of this species.

Genus PETRŒCA, *Savainson*.*Petrœca leggii*.

SCARLET-BREASTED ROBIN.

Petrœca multicolor, (nec Gmel.), Gould, Bds. Austr., fol., Vol. III., pl. 3 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 279 (1865).

Petrœca leggii, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 165 (1879).

ADULT MALE—*General colour above black; lesser wing-coverts black, the median and greater series white; primaries blackish-brown, the inner series with two white streaks on the outer web; secondaries blackish-brown, the median series with their outer webs, and a band across the centre of the inner webs white; tail blackish-brown, the lateral feathers white, margined with blackish-brown on the basal half of the inner web, and towards the tip of the outer web; forehead white; lores, sides of the head and throat black; breast light scarlet; abdomen, flanks, and under tail-coverts white, with blackish-grey bases to all the feathers; bill black; legs and feet black; iris blackish-brown. Total length in the flesh 5·2 inches, wing 3, tail 2·2, bill 0·4, tarsus 0·8.*

ADULT FEMALE—*General colour above brown; upper wing-coverts brown, the median and greater series tipped with buff; quills brown, and similarly marked as those of the male, but with buffy-white; tail brown, the lateral feathers marked with white as in the male; a small spot on the forehead white; sides of the head and neck brown; chin and throat dull greyish-white; remainder of the under surface dull white; the chest and breast strongly washed with light scarlet; sides of the breast and the abdomen pale brown; under tail-coverts dull white.*

Distribution.—Queensland, New South Wales, Victoria, South Australia, Western Australia, Tasmania.

IN favourable situations the Scarlet-breasted Robin is generally distributed over the greater portion of Eastern and Southern Australia, and likewise Tasmania. It is more freely dispersed throughout the coastal districts and contiguous mountain ranges, and is seldom met with in the large open expanses of dry country far inland. Humid mountain ranges are its favourite haunts during spring and summer, more especially where clearings have been made and the stumps still remain. At the end of autumn it visits the flats and open forest lands near the coast, and may sometimes be seen in the public parks and gardens of our cities, remaining there throughout the winter, and returning as a rule to the mountain ranges for the purposes of breeding early in the spring.

Considerable variation exists in the size of the white frontal spot, both in the males and females, and the extent of the white markings on the wings and tail, some specimens having all the tail feathers narrowly tipped with white. In young birds the white frontal marking is small, and it increases in size with age, extending on to the crown of the head in very old birds. Gould points out that "a slight difference exists in the depth of the colouring of specimens from the western and eastern coasts; those from the former, particularly the females, having the scarlet more brilliant than those from New South Wales and Tasmania; the difference, however, is too trivial to be regarded otherwise than as indicative of a mere variety." The most brilliantly coloured male in the large series of these birds from all parts of Australia and Tasmania in the Australian Museum collection, is a specimen procured at Liverpool, near Sydney. The most richly coloured female is a specimen obtained at Lithgow, in the Blue Mountains, in 1888. Dr. Sharpe, in describing this species in the "Catalogue of Birds in the British Museum," writes:—"A female from King George's Sound, Western

* Handbk. Bds. Austr., Vol. i., p. 279 (1865).

† Cat. Bds. Brit. Mus., Vol. iv., p. 166 (1879).

Australia, differs from all the eastern birds in its extremely narrow white forehead, and may probably indicate a second species." Later on Dr. Sharpe separated the examples from Western Australia as distinct on account of the smaller white frontal marking and less extent of white on the wings. I am inclined to agree with Gould, however, that the Scarlet-breasted Robin of Western Australia is not a distinct species, but at the most a western race of *Petroica leggii*.

The same variation in size of the white marking on the forehead may also be observed in *P. phoenicea*. The largest and smallest-capped adult males of both species in the Australian Museum collection, were obtained by Mr. R. Grant at Lithgow, on the Blue Mountains, where both species are numerous, and where he has found them breeding.

The note of the Scarlet-breasted Robin is sweet and low, and is usually uttered when the little songster is perched on the top of a stump, a fence, or a large stone. It may be heard to advantage just before daylight, especially in a clearing in a mountain valley, which often fairly resounds with the notes of these birds as they answer one another from stump to stump where they are perched. Its food consists of insects, principally small moths, butterflies, beetles, flies, and their larvæ, also worms procured about cultivation paddocks and grass lands. It is an extremely familiar bird, and enters orchards and gardens freely in search of food.

The nest is a round open cup-shaped structure, outwardly composed of strips of bark, mosses, and dried grasses, securely woven and held together, the inside being thickly and warmly lined with cow-hair, opossum fur, feathers, or other soft material; the downy covering of the freshly-budded fern fronds being more often used when built in mountain ranges. The rim of the nest is thick and rounded, and externally the structure is lightly coated with spider's web, to which is attached small pieces of bark, charred wood, or lichens, the decorations varying with the surroundings of the nest. An average nest measures externally three inches and a half in diameter by two inches and a half in depth, the inner cup measuring two inches in diameter by one inch and a half in depth. The situation selected for the nest is varied; sometimes it is placed on the top of a horizontal branch or in the forked limb of a low tree. A favourite situation is between a piece of projecting bark and the stem of a tree, or on the roughened wood inside the charred trunk of a hollow stump or tree. In South Gippsland, I have frequently found the nest of this species by tapping on the hollow trunk of some burnt out giant of the forest, or by watching the bird fly into one of the apertures made by fire in the hole of a large tree. Whatever site is chosen, the exterior of the nest is made to closely assimilate its environment. A nest of this species in the Australian Museum collection, taken by Mr. J. Gabriel at Bayswater, Victoria, on the 15th November, 1894, is placed in a very well concealed situation. It is formed in a small blackened cavity, burnt out of the thin stem of a Mountain Musk (*Aster argophylla*), and is outwardly constructed of very fine strips of the inner bark of a *Eucalyptus*, intermingled with the soft downy covering of the freshly budded fronds of a tree fern, and thickly lined inside with opossum fur. Only one side and the rim of the nest are visible, which are ornamented with small fragments of charred wood, attached by means of cobweb. Usually the nesting site does not exceed ten or twelve feet from the ground, frequently it is within hand's reach, but in rare instances it may be found at a height of thirty or forty feet.

From Dr. L. Holden's MS. notes, I extract the following:—"On the 11th November, 1886, I found a nest of the Scarlet-breasted Robin in a paddock at Circular Head, Tasmania, containing three hard-set eggs. It was built at the junction of a forked horizontal branch of a large isolated box-tree at a height of eleven feet from the ground, and was a very neat and well concealed cup-shaped structure. Exteriously it was formed of narrow strips of

bark, and ornamented with bits of lichen to imitate the bark of the tree, the inside being thickly fitted with hair and fur. The female sat very close. On the 21st November, I found another nest of this species with three fresh eggs. It was built against the bole of a tea-tree, and supported by a projecting twig, at a height of fifteen feet from the ground. I saw a pair building on the 10th September, 1890, in a tea-tree sapling, ten feet up, in an upright fork."

The eggs are usually three, sometimes four in number for a sitting, and are oval or rounded oval in form, the shell being close-grained and its surface dull and lustreless. The ground colour varies from a pale green or bluish-white to dull brownish-white, some specimens being thickly freckled, spotted and blotched with wood-brown, olive-brown, and underlying markings of purplish-grey, almost obscuring the ground colour; others are sparingly but distinctly dotted or spotted with purplish-brown or lilac-grey, the latter appearing as if beneath the surface of the shell. Sometimes the markings predominate on the thicker end or around the centre of the shell, but specimens may be also found which have the markings evenly distributed over the surface or entirely confined to one end. A set of three, taken by me at Middle Harbour on the 2nd September, 1901, is the only instance I have known of this bird breeding near Sydney. The eggs are of a faint greyish-blue ground colour, minutely freckled with pale brown, except on the thicker end where these markings are intermingled with others of blackish-brown, and underlying spots of violet-grey forming more or less well defined zones. Length (A) 0.75×0.55 inches; (B) 0.74×0.54 inches; (C) 0.74×0.56 inches. A set of three, taken at Circular Head, Tasmania, on the 11th November, 1886, measures:—Length (A) 0.75×0.55 inches; (B) 0.76×0.58 inches; (C) 0.73×0.57 inches. Like all eggs with semi-transparent shells, even when fresh, the eggs of this genus are more beautiful directly after they have been emptied of their contents.

In three adult males in the Australian Museum collection, the white feathers bordering the upper part of the frontal band are tipped with light scarlet. A semi-albino adult male has the primaries, secondaries, upper tail-coverts and tail white, the quills and tail-feathers having blackish shafts.

August and the four following months constitute the usual breeding season of this species in Eastern Australia and Tasmania, but Dr. A. M. Morgan informs me that he found a nest in the Mount Lofty Ranges, near Adelaide, with a fresh egg in it about the middle of June. Nests with eggs are more frequently found on the Blue Mountains towards the latter end of September or early in October, but in South Gippsland I have found them at the end of November.

Petroeca phœnicea.

FLAME-BREASTED ROBIN.

Petroeca phœnicea, Gould, Proc. Zool. Soc., 1836, p. 105; *id.*, Bds. Austr., fol., Vol. III., pl. 6 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 282 (1865).

Petroeca phœnicea, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 166 (1879).

ADULT MALE—*General colour above greyish-black: upper wing coverts and quills slightly darker, the inner median, and greater wing-coverts, and the outer webs of the inner secondaries white; an oblong spot near the centre of the outer webs of the primaries and a bar across the secondaries near the base white; tail blackish, the outermost feather white, margined with blackish-brown on the inner web and towards the tip of the outer web, the next feather externally edged with white on the outer web; on the forehead a small white spot; lores, feathers in front, and below the eye blackish; sides of the face, ear-coverts, and chin blackish-grey; remainder of the under surface orange-scarlet; lower*

portion of the abdomen and under tail-coverts white; bill black; legs and feet blackish-brown; iris blackish-brown. Total length in the flesh 5.3 inches, wing 3.1, tail 2.5, bill 0.4, tarsus 0.8.

ADULT FEMALE—General colour above brown, wings and tail dark brown, the former marked with buffy-white, and the latter with white as in the male; on the forehead a small indistinct dull white or buffy white spot; ear-coverts brown; chin and throat dull white, shaded with brown; remainder of the under surface brown; centre of the abdomen and under tail-coverts dull white.

Distribution.—New South Wales, Victoria, South Australia, Tasmania, Islands of Bass Strait.

ALTHOUGH very common in the coastal ranges and Blue Mountains in New South Wales, the Flame-breasted Robin is more abundantly distributed throughout Victoria and Tasmania; it is also found in South Australia and on some of the islands of Bass Strait. During the late autumn and winter months it is particularly numerous about newly ploughed lands and on the open plains to the north and west of Melbourne, haunting also the low intersecting stone walls and fences about the Werribee, Keilor, and Maribyrnong. In the latter neighbourhood, for several seasons, a pair used to frequent the trees around my house, arriving at the latter end of April and remaining until the end of August. They were exceedingly tame, especially the male, and I used to feed them with bread crumbs, which they would readily venture into outhouses to obtain. In the spring and early summer months I found this species breeding in company with the Scarlet-breasted Robin in clearings made in the heavily timbered ranges of South Gippsland. It also breeds on the Blue Mountains in New South Wales, but unlike *Petroica legga*, it is very rarely seen in the neighbourhood of Sydney during the winter months.

From Victoria, Mr. G. A. Keartland writes: "Immediately the winter ploughing is started, the Flame-breasted Robins make their appearance, probably attracted by the number of insects and their larvæ, which they find in the newly-turned soil. I have counted as many as thirteen bright male birds hopping along a single furrow. At what age the adult male assumes his gay attire I am unable to state, but during November, 1891, I saw a pair in the modest garb of the female building their nest at Bayswater, in the Dandenong Ranges. A fortnight later I took three partly incubated eggs from it after seeing both birds again at the nest, which was situated in a slight hollow in a charred stump about fourteen feet from the ground." Mr. A. E. Ivatt also informs me that he found the nests of this species at Glanmire, near Bathurst, in 1896, in which the birds of both sexes were brown, and without any indication of the scarlet breast."

Mr. A. Zietz, the Assistant Director of the South Australian Museum, writes me:—"On the 12th May, 1901, while out with my son, we saw a number of *Petroica phoenicea* scattered over a newly ploughed field, between Modbury and Tea-tree Gully, about ten miles north-east of Adelaide. We also observed this species the previous year about the same time, but not quite so numerous. Somewhat later they all disappeared. One of our Museum collectors, the late Mr. F. W. Andrews, observed Flame-breasted Robins many years ago at Square Waterhole, south of Adelaide. He was under the impression that they bred there, but I never saw the nest or eggs of this species in his or any other collection that were taken in this State."

Writing from the Western District, Victoria, Dr. W. Macgillivray remarks:—"Towards the end of March, or early in April, young males and females of *Petroica phoenicea* first make their appearance in the more open parts of the Hamilton District, the adult males generally following in about a fortnight; they remain during the winter months and all leave for their nesting grounds before the end of August. I took a nest of this species in a patch of timber near Portland, on the 12th November; it was placed in a small stunted gum at a height of fifteen feet, and contained two fresh eggs."

The notes of the Flame-breasted Robin are more musical and prolonged than those of its congener *Petraca legga*. Dr. L. Holden, writing from Circular Head, Tasmania, in August, 1887, states:—"The note of *Petraca phoenicea* is a song of nine inflections, uttered in groups of three, thus: 'you-may-come, if-you-will, to-the-sea.' They sing it perched on rails, bushes, or stones, but not, I think, when merely seeking food on the ground. I have heard the same song from fully plumaged males, and from females or young birds without any red on the breast." From Waratah, Mount Bischoff, Tasmania, where these birds are extremely common, Mr. R. N. Atkinson writes:—"The note of the Flame-breasted Robin is a very sweet little trill, and it often sounds to me as if it were saying, 'you are not -a pretty little bird -like me.' Both sexes have the same notes, except that the female utters a kind of hiss when one approaches her while sitting on her nest."

The food of this species consists of insects of various kinds, grubs, and worms, which it procures chiefly on the ground.

The nest is exteriorly formed of very fine strips of soft bark, fern down, and grasses, thickly coated with dry mosses or spider webs; the inside, which is cup-shaped and neatly made, being thickly lined with cow-hair, opossum fur, or the brown downy covering from freshly budded fern-fronds. When built in the neighbourhood of houses, pieces of cotton, silk, or string frequently form portion of the lining. At all times, whether constructed inside the charred trunk of a tree or in exposed situations, the outer portion of the nest is made to closely resemble its immediate surroundings. An average nest measures externally four inches in diameter by two inches and a quarter in height, the inner cup being two inches across by one inch and a half in depth. Another nest now before me, taken from a charred trunk of a tree, resembles in form a half cocoa-nut shell with the rounded side uppermost, and in which is a small cup-like cavity at the top. It is formed externally of very fine dried mosses and strips and shreds of bark, which are thickly coated with blackened spiders' webs, assimilating closely in colour to the place where it was built. The inner portion of the nest and its foundation consists of the soft downy covering of the freshly budded fronds of a tree-fern. It measures across the base, where it is nearly flat, four inches and a half, with a depth of three inches; the internal diameter is one inch and three-quarters, with a depth of one inch and a half. The site usually selected by the bird for its nest is between a projecting piece of bark and the side of a tree or stump, or in the burnt-out trunk of a hollow tree, and sometimes on the ledge of an embankment or in the end of a hollow log. As a rule, when built in trees, they are placed from five to twenty feet from the ground, seldom higher.

Mr. R. N. Atkinson, from whom a nest and several sets of the eggs of this species have been received, informs me that on two occasions upon taking nests with only two eggs in each, he has, upon visiting the places again, obtained a third egg from the bare hole where the nest had been previously built.

From Dr. L. Holden's MS. notes, made at Circular Head, on the north-western coast of Tasmania, I extract the following:—"On the 12th November, 1890, I found a nest of the Flame-breasted Robin, with three eggs, built on the side of a bank above a steep road at Greenhills. Although the bank was bare of herbage, and I was close by when the female flew off, I stared at the nest some seconds before I discerned it, so exactly did it resemble a lichen-covered stone. On the 7th October, 1891, I took another set of eggs from a nest built on the same bank, and from the same pair of birds took a set of three eggs a fortnight later. The nest-hole was among grass and not on the bare earth bank just below it. I saw a pair on the 12th December, 1891, building in a she-oak at the edge of the beach. The nest was at the extremity of a bough, about five feet from the ground, and was the first of this species I had seen in such a situation. In September, 1893, I found a nest with three hard-set eggs in a stone wall, on a farm at Greenhills."

The eggs are usually three, sometimes four in number for a sitting, and like those of *Petroica leggeni*, from which they are indistinguishable, present the same difference in the colour and character of their markings. The most common type has the ground colour of a pale bluish or greenish-white, which is finely freckled, dotted, or irregularly blotched with purplish-brown, amber, wood-brown, and dull lilac-grey underlying markings. Some specimens have only a few large distinct slaty-grey blotches, intermingled with almost invisible dots of the same colour; others are distinctly zoned around the centre, or on the larger end, with different shades of brown, or underlying clouded bands or caps of dull lilac-grey. A set of three, taken at Waratah, measures:—Length (A) 0.73 x 0.61 inches; B 0.74 x 0.61 inches; C 0.73 x 0.60 inches. Another set of three, taken in the same locality, measures:—(A) 0.77 x 0.54 inches; B 0.67 x 0.50 inches; C 0.68 x 0.55 inches. A set of three, taken at Circular Head on the 21st October, 1891, measures:—A 0.70 x 0.60 inches; B 0.68 x 0.58 inches; C 0.77 x 0.6 inches.

September and the four following months, constitute the usual breeding season of this species.

Petroica goodenovii.

RED-CAPPED ROBIN

Muscicapa goodenovii, Vig. and Horsf., Trans. Linn. Soc., Vol. XV., p. 245 (1826).

Petroica goodenovii, Gould, Bds. Austr. fol., Vol. III., pl. 5 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 280 (1855).

Petroica goodenovii, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 171 (1879).

ADULT MALE—*General colour above dull black, wings brownish-black, the inner median and greater wing-coverts and the outer webs of the inner secondaries white; an oblong spot near the centre of the outer webs of the inner primaries, and a bar across the secondaries near the base white; tail feathers brownish-black, narrowly edged at the tips with white, the outermost feather white margined with brown on the inner web and towards the tip of the outer web, the next feather white on the outer web with an indistinct brownish spot near the tip, and the third feather narrowly margined with white on the outer web; forehead and the anterior portion of the crown scarlet; sides of the head and throat black; fore-neck and breast scarlet, abdomen, flanks, and under tail-coverts white; bill black; legs and feet blackish-brown; iris dark brown. Total length in the flesh 4.75 inches, wing 2.5, tail 1.8, bill 0.4, tarsus 0.7.*

ADULT FEMALE—*General colour above brown; upper wing-coverts brown, the inner greater coverts tipped with buff, bases of the secondaries pale buff; quills and tail feathers dark brown, and similarly washed with white as in the male; cap on the forehead dull red; lores, cheek, and throat dull white; fore-neck and breast pale brown; abdomen and under tail-coverts dull white.*

Distribution.—Queensland, New South Wales, Victoria, South Australia, Western Australia, Central Australia.

WITH the exception of the northern portion of the continent, the Red-capped Robin is distributed in favourable situations over most parts of Australia. It is usually met with singly or in pairs, and evinces a decided preference for the scrubby inland portions of the States. It is freely distributed throughout the western half of New South Wales, but is rarely met with in the open forest lands of the coastal districts. At Wellington and Dubbo I found it plentifully dispersed throughout the lightly-timbered pine scrubs, and it was equally numerous in the myall scrubs between Narriabri and Moree, in the north-western portions of the State, and it is found in similar country throughout South-western Queensland. Near Melbourne, I once observed an adult male in the scrub on the beach near Brighton, and saw another the

following season at Oakleigh. It is an occasional visitant to Melton, and is a common species in the mallee scrubs of the Wimmera District of North-western Victoria. Mr. G. A. Keartland met with it during his journeys in Central and Western Australia, and was informed that it occasionally frequents the Fitzroy River and its vicinity in North-western Australia, but he did not meet with it while camped there for several months.

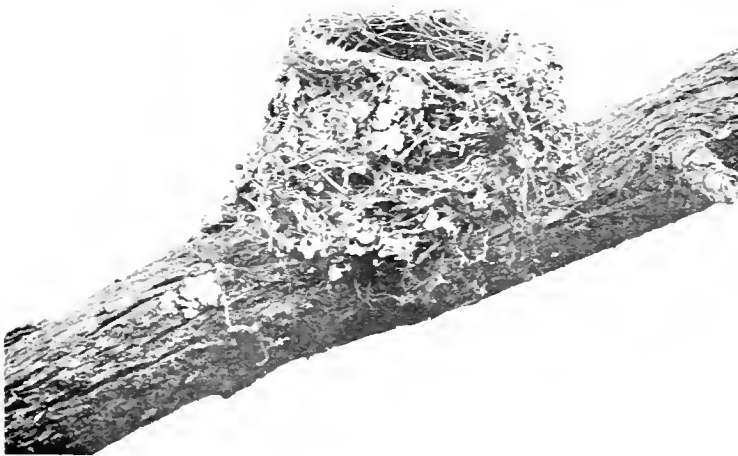
Dr. W. Macgillivray writes me from South-western New South Wales:—"The Red-capped Robin is frequently seen in the private gardens in Broken Hill during the winter and early spring months. Out in the open country it is met with in the patches of prickly acacias."

It is common in the inland portions of South Australia, where Dr. A. M. Morgan found it building freely during the latter part of July, and found a nest with two fresh eggs on the 4th August, 1900, at Mount Gunson, about one hundred miles north-west of Port Augusta.

In some males, both immature and adult, from Eastern and Western Australia, the scarlet feathers of the fore-neck and breast extend on to the chin, and are intermingled with the black

feathers of the centre of the throat. The extent of white on the wings and tail of both sexes varies, and some adult males have all the quills narrowly tipped with white. Females may often be found breeding before assuming the dull red cap on the forehead. The food of this species consists entirely of small insects and their larvæ.

The nest internally is a small cup-shaped structure, the outer portion varying according



NEST OF RED-CAPPED ROBIN

to the position in which it is built. It is composed of very fine strips or shreds of bark and dried grasses, held together with cobwebs, the inside being lined with cow-hair, opossum or rabbit fur; sometimes a few feathers are intermingled, in others they are lined entirely with soft dried grasses. Externally it is decorated with pieces of lichen, and is usually made to resemble its surroundings. The rim is sometimes thick and rounded, especially when wool is used in the construction of the nest; at other times it is sharp and thin, as shown in the one figured above. An average nest measures externally two inches and a quarter in diameter by one inch and three-quarters in depth, the inner cup measuring one inch and a half in diameter by one inch in depth. Sometimes the nest is built in an upright fork, or on the top of a thick horizontal branch; at other times it is placed between several thin forked stems, or built up against the trunk of a tree, and supported by a small twig. One now before me has only one-half of the external portion of the nest visible, the other side being built against a thick fork. Another very beautiful nest, taken by Mr. E. H. Lane on Wambangalang Station, near Dubbo, is built in an unusual position. It is placed inside and near the end of a spat formed by a piece of curled dried bark of a *Eucalyptus*, that was hanging to the underside of a branch, about nine feet from the ground. Externally it is of irregular shape to fit the place

of bark, but is very neat and smoothly formed of shreds of bark held together with a fine lace-work of spiders' webs, the inside being neatly lined with fur and feathers, and the outside ornamented with small pieces of white lichen. The nest figured, which contained two fresh eggs, was taken by Mr. E. H. Lane at Wambangalang, on 15th August, 1898. The different species of pines, acacias, gums, and oaks are chiefly resorted to as nesting-sites, although any bush or low tree may be selected, and they are often found in briar bushes. Generally they are placed within a few feet of the ground, but vary according to the locality, and are sometimes built at an altitude of thirty feet.

The eggs are usually two, sometimes three, in number for a sitting, and vary considerably in colour and the disposition of their markings. They are oval or rounded oval in form, the shell being close-grained, smooth, and lustreless. The ground colour varies from a faint bluish-white to a rich greyish-green, and this is minutely dotted, spotted, or blotched with brown, reddish-brown, wood-brown, or purplish-brown, intermingled in some specimens with underlying spots of dull violet-grey. Some eggs are evenly marked all over, but as a rule the markings are larger and predominate towards the centre, and on the thicker end, where they form a more or less well defined cap or zone: others are peppered on the larger end only with almost invisible dots of faint reddish-grey. A set of two measures: Length (A) 0.65×0.47 inches; (B) 0.63×0.47 inches. A set of three measures: —(A) 0.63×0.51 inches; (B) 0.64×0.5 inches; (C) 0.64×0.51 inches. Another set of three measures: (A) 0.6×0.49 inches; (B) 0.61×0.49 inches; (C) 0.6×0.5 inches.

The young male resembles the adult female, having a dull red cap on the forehead, and some of the feathers on the breast slightly tinged with red. One specimen in the Australian Museum collection, has also the feathers in the centre of the upper portion of the throat washed with red.

The Red-capped Robin is frequently the foster parent of the Rufous-tailed Bronze Cuckoo (*Lamprolaima basalis*).

In Eastern and Southern Australia, the breeding season commences about the middle of July, and continues until the end of December. Probably two or more broods are reared in a season.

Genus MELANODRYAS, Gould

Melanodryas bicolor.

HOODED ROBIN.

Grallina bicolor, Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 233 (1826).

Petroica bicolor, Gould, Bds. Austr., fol., Vol. III., pl. 7 (1848).

Melanodryas cucullata, Gould, Handbk. Bds. Austr., Vol. I., p. 283 (1865).

Petroica bicolor, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 173 (1879).

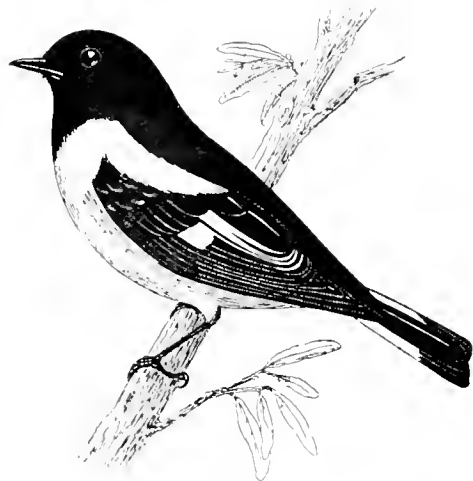
ADULT MALE—General colour above glossy black; scapulars white; wings brownish-black, outer webs and tips of inner secondaries, and a band across the quills, except on the outer primaries white; two central tail feathers black, the next on either side black with the outer web white for two-thirds of its length; the remainder white largely tipped with black; head glossy black; throat and fore-neck glossy black; remainder of the under surface white; bill black; legs and feet black; iris brownish-black. Total length in the flesh 6.5 inches, wing 4.1, tail 2.8, bill 0.5, tarsus 0.95.

ADULT FEMALE—General colour above brownish-grey; wings and tail dark brown, and similarly marked with white as in the male, except in having a narrow white margin to the apical portion of the outer web of the outermost tail feather; lores and chin dull white; feathers below the eye and the

ear-coverts dark brown, with dull white shaft streaks; throat, fore-neck, and breast pale brownish-grey; abdomen, vent, and under tail-coverts white.

Distribution.—Northern Territory of South Australia, Queensland, New South Wales, Victoria, South Australia, Central Australia, Western and North-western Australia.

THE Hooded, or Black and White Robin as it is more commonly called, is distributed in favourable situations over the greater portion of the Australian continent. Considerable variation exists in the size of this species, specimens from Eastern Australia being larger than examples from Western Australia. Again, specimens from humid mountainous districts are usually larger than those found only a few hundred miles away on arid and sparsely timbered plains. The above described specimens were collected by me at Wellington, New South Wales, the wing-measurement of other adults obtained at the same time varying from 3.95 to 4.1 inches, and those of the females from 3.75 to 3.85 inches. These are the average measurements also of specimens obtained in the open forest lands about Seven Hills and Blacktown, near Sydney, and in the mountain ranges in the Illawarra District. The wing measurement of an adult male, collected at Coombi, in the Western District of New South Wales, by the late Mr. K. H. Bennett, is only 3.65 inches. The wing measurements of an immature male and female



HOODED ROBIN.

obtained with their nest and eggs near Bourke in 1876, are respectively 3.65 and 3.6 inches. The nest and eggs of this pair of birds were described by me under the name of *Melanodryas picata*, but since I have had an opportunity of examining the skins, I find that they are only young birds of *M. bicolor*, that were breeding before attaining full adult livery, which is of common occurrence in this species. The average wing measurement of adult males from South and Western Australia varies from 3.6 to 3.7 inches, intergrading completely with the north-western and northern race, separated by Gould under the name of *M. picata*. Typical specimens of the latter from Derby, collected by Mr. E. J. Cairn and the late Mr. T. H. Bowyer-Bower, vary in wing measurement from 3.5 to 3.55 inches.

Dr. Sharpe, in his description of *M. bicolor*, in the "Catalogue of the Birds in the British Museum," gives the wing measurement of the adult male as 3.7 inches. To *M. picata*, Gould, he accords subspecific rank on account of its smaller size, and states that it is "distinguished by the less amount of black on the tail, and the broader edging of white to the inner secondaries. In the outer tail-feather the white extends round the black, and is carried along the whole length of the outer web." The characters pointed out by Dr. Sharpe, however, have no specific or subspecific value, for they are only those of a newly moulted bird, and may be seen in examples from both Eastern and Western Australia, the white gradually decreasing until it is nearly or entirely lost just prior to moult. Of two adult males of the smaller race, obtained by Mr. E. J. Cairn, at Derby, one has the tips only of the secondaries white, and the apical portion of all the lateral tail feathers entirely black; the other, an adult male in the moult, has the tips of all and the outer webs of the inner secondaries broadly margined with white, the apical portion of the old lateral tail-feathers on one side entirely black, and the four outer new feathers on the other side broadly tipped with white, which

* Proc Linn Soc. N.S.W., 2nd ser., Vol. ii., p. 557 (1877).

also extends along the outer web of the outermost feather. The wing measurement given by Vigors and Horsfield of the type of *M. bicolor*, which was obtained at Prospect Hill, near Sydney, is $3\frac{1}{2}$ inches. Undoubtedly when examples from North-western Australia are compared with others obtained in cool districts in the south-eastern portions of the continent, the former would be regarded as a smaller race of *M. bicolor*. As I have previously pointed out, however, when a large number of specimens from different parts of the continent are examined, the two races will be found, as regards size, to completely intergrade one with the other.

In New South Wales the Hooded Robin frequents open forest and partially cleared lands, mountain ranges, and belts of timber growing on the plains. I found it exceedingly common in the open pine scrubs in the neighbourhood of Wellington and Dubbo, and it may be met with throughout the Blue Mountains. Near Sydney it breeds on the flats and open forest lands between the Nepean River and Parramatta, and occasionally at Belmore, the nearest locality I have found it to the coast. Of unobtrusive habits and of feeble powers of song, one's attention is generally arrested by the conspicuous black and white plumage of the male, for it is usually met with in pairs.

The food of this species consists principally of various kinds of insects, of which a great portion is obtained upon the ground.

The nest is an open cup-shaped structure, formed externally of strips of bark and dried grasses, held together with a slight addition of cobwebs, and is usually lined with fine wiry grasses and rootlets. The outer portion of the nest varies according to its position; when built between the junction of a horizontal fork only the rim is visible, but when placed in an upright fork the exposed parts of it are sometimes ornamented with strips of bark longitudinally attached by means of cobwebs, in a similar manner to the decorations of some nests of *Eopsaltria australis*. A neat and well formed nest, taken at Belmore on the 14th August, 1899, measures externally three inches and a quarter in diameter by two inches and a quarter in depth, the inner cup measuring two inches and a quarter in diameter by one inch and a quarter in depth. It was built in the fork of a *Melaleuca*, close to where an upright branch had been cut off, and contained two fresh eggs. Another nest, now before me, taken by Mr. E. H. Lane at Wambangalang, is built in the fork of a fallen branch, and is further supported by another branch crossing the fork near its junction. This nest was two feet and a half from the ground. Usually they are made to resemble the roughened bark on which they are placed, and are built at an altitude varying from two to twelve feet. At Yultacowie Creek, about one hundred and twenty miles north-west of Port Augusta, Dr. A. M. Morgan found on the 11th August, 1900, a nest of this species containing two eggs, built in the *débris* left by floods near the bank of the creek.

Eggs usually two, rarely three in number for a sitting, oval or elongate oval in form, the shell being close-grained, smooth, and lustrous. They vary from a very pale olive to asparagus and apple-green, and are usually more or less clouded with rich brown, particularly on the larger end where a perfect cap or zone is sometimes formed. Many specimens are uniform in colour, others have the ground colour darker on the larger end. A set of two, taken at Belmore, measures:—Length (A) 0.87×0.56 inches; (B) 0.87×0.64 inches. Another set, taken near Bourke, measures:—(A) 0.8×0.6 inches; (B) 0.78×0.6 inches. These latter eggs agree in size with others taken by Mr. G. A. Kearland in North-western Australia.

Young males resemble the adult female, but have the upper parts more strongly washed with grey; scapulars dull white with blackish-grey centres; chin, throat, and fore-neck, dull

white mottled with dark brown: remainder of the under surface dull white. Wing 3.5 inches.

The figure represents an adult male.

August and the four following months constitute the usual breeding season of this species in Eastern and Southern Australia, during which time two broods are reared. In New South Wales, nests with fresh eggs are generally found in August and November.

Genus AMAURODRYAS, Gould.

Amaurodryas vittata.

DUSKY ROBIN

Gobe-mouche à bande, Quoy et Gaim., Voy. de l'Astrol., Atlas, pl. 3, fig. 2.

Muscicapa vittata, Quoy et Gaim., Voy. de l'Astrol., Zool., Tom. I., p. 173 (1830).

Petroica fusca, Gould, Bds. Austr., fol., Vol. III., pl. 8 (1848).

Amaurodryas vittata, Gould, Handbk. Bds. Austr., Vol. I., p. 286 (1865).

Petroica vittata, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 177 (1879).

ADULT MALE—General colour above brown, tinged with olive; lesser and median wing-coverts like the back, the greater coverts blackish-brown, with whitish tips; quills dark brown, crossed near the base except on the outer primaries with a dull white band, the inner secondaries narrowly edged and tipped with brownish white; tail brown, the tips of the three outer feathers and the external web of the outermost one white; lores blackish; ear-coverts brown with dull white shaft lines; throat greyish-white; remainder of the under surface pale brown, slightly tinged with buff; centre of the abdomen dull white; under tail-coverts brown, indistinctly tipped with white; bill black; legs and feet black; iris dark stone colour" (Atkinson). Total length in the flesh 6.8 inches, wing 3.6, tail 2.65, bill 0.5, tarsus 0.95.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Tasmania, and some of the Islands of Bass Strait.

MM. QUOY AND GAIMARD first figured this species in the Atlas of the "Voyage de l'Astrolabe." Subsequently, in dealing with it under the name of *Muscicapa vittata*, it is stated that it inhabits King George's Sound, New Holland. This is undoubtedly an error, and is probably the reason Gould in his Handbook placed a query against Quoy and Gaimard's figure, being the same as his *Petroica fusca*, under which name he figured this species in his folio edition of the "Birds of Australia."

There are a number of skins in the Australian Museum collection, obtained by Mr. George Masters in different parts of Southern Tasmania, and specimens have been recently received in the flesh from Mr. E. D. Atkinson, of Waratah. I have also received its eggs from the north-western coast of Tasmania, and from King Island, but have never met with this species or know of any authentic record of it being found in Australia. The wing measurement of adult males varies from 3.45 to 3.65 inches. Just prior to the moult the white tips of the outer tail feathers are narrower and less distinct.

I have examined stomachs of these birds that were obtained by Mr. E. D. Atkinson at Waratah, Mount Bischoff, on the 12th July, 1902, in the depth of winter, and found them to contain several kinds of small seeds and a few bits of gravel. There was no trace of insects upon which they chiefly live during the spring and summer months.

* Voy. de l'Astrol., Zool., tom. i., p. 174 (1830).

From Dr. L. Holden's MS. notes, made while resident at Circular Head, Tasmania, I have extracted the following information:—"On the 29th August, 1886, I found a nest of *Amalindryas vittata*, containing one egg. It was a round open structure, formed of twigs and bark, and lined with wool, and was built in the central fork of a thorny bush about four feet from the ground. On the 7th October I found another with three eggs. This nest was lined with horse and cow-hair. As I approached it, the bird flew off feigning lameness. Similar tactics were adopted by another bird whose nest I found with three half-grown young on the 31st August, 1887. The bush this nest was built in, was the same that the birds bred in two years before. The following week I found another with young, and on the 14th October a nest with three hard set eggs. On the 5th August, 1888, I discovered a nest with three fresh eggs close to the one I found in the same month of the preceding year. These birds utter a loud disyllabic note: a rather long drawn and somewhat plaintive call. When one approaches near their nests, they usually feign lameness or a broken wing."

Mr. E. D. Atkinson, while living at Table Cape, on the north-western coast of Tasmania, forwarded me three sets of eggs. One was taken on the 12th November, 1891, from a nest built in a "chip-hole" in the trunk of a tree in his paddock; three fresh eggs being taken, on the 25th December following, from another nest built in the same place. With another set of three, taken on the 16th November, he writes:—"There were five nests all built on top of one another, and looked like so many basins packed up. They were placed in an old dead stump, which had probably been used by the same pair of birds as a nesting-site for several seasons. This bird resorts to the usual device of many species in feigning a broken leg or wing when its nest is approached, with the object of alluring one away from it."

Mr. R. N. Atkinson informs me that the Dusky Robin is fairly numerous on Mount Bischoff, and that it usually frequents the cleared spaces around the edge of the forest. It builds on the side of a stump, sometimes in the end of a log, and not infrequently in a tree some height from the ground. A nest now before me, taken by him at Waratah on the 20th October, 1899, from the side of a stump, is a cup-shaped structure, rather irregularly formed externally of fibrous rootlets, with which is intermingled a few strips of bark and very fine dried grasses, the whole being lined with a mixture of very fine rootlets, opossum fur, and black horsehair. Its average measurements externally are four inches in diameter by two inches in depth, the inner cup two inches and a half in diameter by one inch and a half in depth.

The eggs are usually three in number for a sitting, and resemble those of *Melanodryas bicolor*. They are oval or elongate-oval in form, the shell being close-grained, smooth, and slightly lustrous. In ground colour they vary from pale greenish-blue to apple-green, which is more or less distinctly shaded with brownish-olive, particularly on the larger end, where an indistinct zone or cap is sometimes formed. Others have distinct spots, smudges, or clouded patches varying in tint from dull reddish-brown to pale brownish olive. A set of three, taken by Dr. L. Holden at Circular Head, Tasmania, on the 4th October, 1891, measures as follows:—Length (A) 0.93 × 0.7 inches; (B) 0.88 × 0.66 inches; (C) 0.88 × 0.68 inches. A set of three, taken by Mr. R. N. Atkinson, at Waratah, Mount Bischoff, in October, 1899, measures:—(A) 0.84 × 0.63 inches; (B) 0.87 × 0.64 inches; (C) 0.87 × 0.63 inches. Another set from the same locality measures:—(A) 0.9 × 0.66 inches; (B) 0.93 × 0.7 inches; (C) 0.93 × 0.68 inches.

The usual breeding season of this species commences about the middle of July, and continues until the end of December, during which time two or more broods are reared. As will be seen from Dr. Holden's and Mr. Atkinson's notes, fresh eggs have been found as early as the 5th August and as late as the 25th December. In the latter instance, presumably the same pair of birds had been robbed of their eggs about the middle of November.

Genus **HETEROMYIAS**, Sharpe.**Meteromyias cinereifrons.**

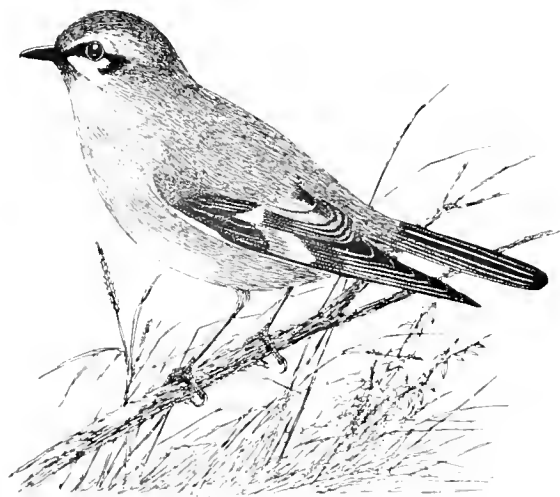
ASHY-FRONTED ROBIN.

Pacilodryas? cinereifrons, Ramsay, Proc. Zool. Soc., 1875, p. 588.

Heteromyias cinereifrons, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 239 (1879); Gould, Bds. New Guin., Vol. II., pl. 15 (1888); North, Rec. Austr. Mus., Vol. I., p. 37 (1890).

ADULT MALE.—General colour above olive-brown, the upper parts strongly washed with rufous, lesser and median wing-coverts ashy-grey, the greater coverts and primary coverts black; basal half of the quills black, crossed with a white band, the apical portion olive-brown on their outer webs, dark brown on their inner webs; tail brown, strongly washed with rufous, the three outer feathers narrowly tipped with white on their inner webs; head dark ashy-grey, slightly tinged with olive-brown; a broad stripe over the eye which extends on to the sides of the nape light grey; lores and chin blackish-grey; ear-coverts olive-brown, blackish at the base; feathers below the eye and the throat white; fore-neck and chest light grey, centre of the breast and abdomen white; sides of the body and under tail-coverts tawny-buff; bill blackish-brown, passing into yellowish-brown at the tip; legs and feet flesh colour, iris brown. Total length 6·75 inches, wing 4·1, tail 2·8, bill 0·7, tarsus 1·25.

ADULT FEMALE.—Similar in plumage to the male.



ASHY-FRONTED ROBIN.

Distribution.—North-eastern Queensland.

THE range of the present species extends from the neighbourhood of Cardwell, where the type was obtained, as far north as the Bloomfield River District. It is not found in the brushes near the coast, but on the foothills and higher peaks and table-lands of the contiguous ranges. Messrs. E. J. Cairn and R. Grant procured a fine series of these birds, also several nests and sets of their eggs, while collecting in North-eastern Queensland in 1888-9. The females are slightly smaller than the males, and the wing-measurement of adult specimens of the latter varies from 4·2 to 4·45 inches.

The colours of this species are not so vivid,

and are more harmoniously blended one into the other than is represented in Gould's figure in his "Birds of New Guinea."

Mr. R. Grant has supplied the following notes:—"In the scrubs of the Herberton table-land, we found the favourite haunt of the Ashy-fronted Robin was a packer's track or other clearing. It seems to delight in flitting from one side of the track to the other in the sunshine, then returning back again to the shade of the surrounding foliage. Frequently it may be observed perched motionless on some low branch, intently scanning the ground. Suddenly it darts down to pick up some stray insect and then returns back again to the same place, this action being accompanied by that strange jerking motion of the tail like that of *Eopsaltria australis*, and other members of the family. It is seldom seen at any great distance from the ground. The stomachs of those we examined contained insects of various kinds and their larvæ. Their pretty cup-shaped nests, each containing two eggs, we found built in the lawyer-vines between four and five feet from the ground."

Mr. Frank Hislop informs me that farther north, in the Bloomfield River District, the Ashy-fronted Robin is only found about the tops of the mountains. The nest is placed in a small lawyer-palm, never more than four or five feet from the ground, and one egg is usually laid for a sitting. Mr. R. Hislop writes me that he did not meet with this species on the Endeavour River, which is only a little farther north.

The nest is an open structure, roughly formed externally of a few thin twigs, intermingled with skeletons of leaves, wiry rootlets, and the fibre of the lawyer-vine; the inside is cup-shaped, and lined chiefly with the latter material. Externally it is decorated with mosses and large pieces of lichen. An average nest measures four inches and a half in outer diameter by four inches in depth; the inner cup two inches and a half in diameter by one inch and an eighth in depth. Several nests now before me, obtained by Messrs. Cairn and Grant during September and October, 1889, are built between the forked stems of a lawyer-vine, or where several vines cross one another; others are placed at the base of the leaves and attached on one side to the upright stems.

The number of eggs varies in different districts from one to two for a sitting. They are oval in form, some being much swollen at the larger end, others tapering sharply towards the thinner end, the shell being close-grained, smooth, and slightly lustrous. A common type is of a dull creamy-buff ground colour, which is thickly covered, especially towards the larger end, with indistinct clouded markings of yellowish or pale umber-brown, and somewhat resembling large eggs of *Artamus leucorhynchus*. Others are of a dull greenish-white ground colour, which is freckled, spotted, and distinctly blotched with different shades of umber, intermingled with similar underlying markings of deep bluish grey. Some specimens are heavily blotched on the larger end, the remainder of the shell being almost devoid of markings. Although many eggs are found which have the markings uniformly distributed over the shell, they predominate as a rule on the thicker end, where a cap or zone is sometimes formed. A set of two, taken on the 18th September, 1889, measures: Length (A) 1.05 \times 0.75 inches; (B) 1.07 \times 0.77 inches. Another set measures: (A) 0.98 \times 0.73 inches; (B) 0.96 \times 0.72 inches.

September and the four following months, constitute the usual breeding season of this species.

Genus *PŒCILODRYAS*. Gould.

Pœcilodryas cerviniventris.

BUFF-SIDED ROBIN.

Petroica? cerviniventris, Gould, Proc. Zool. Soc., 1857, p. 221; *id.*, Bds. Austr., fol., Suppl., pl. 15 (1869).

Pœcilodryas cerviniventris, Gould, Handbk. Bds. Austr., Vol. I, p. 288 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 242 (1879); North, Proc. Linn. Soc. N.S.W., 2nd ser., Vol. XXVII., p. 343 (1902).

ADULT MALE—General colour above brown, with a slight ochraceous wash on the back, rump, and upper tail-coverts; upper wing-coverts blackish-brown, the greater series tipped with white and having a large white patch on the center of their inner webs; quills blackish-brown, paler towards the tips, and crossed with a broad white band near the base, the primaries with a very small white tip and a narrow white mark on the apical portion of their outer webs, the latter increasing to a broad white margin and tip on the outer secondaries; the remainder of the secondaries tipped with white except the innermost feathers, which are like the back; tail feathers blackish-brown tipped with white, the tips gradually decreasing in size towards the central pair; head and hind neck dull chocolate-brown; a broad white stripe extends from the nostril over the eye; sides of the face blackish-brown; chin and throat white; fore-neck and breast grey; sides of the body fawn colour, becoming

almost white in the centre of the abdomen; under tail-coverts light fawn colour; bill black, legs and feet dark greyish-brown. Total length 6 inches, wing 3.5, tail 2.75, bill 0.57, tarsus 0.85.

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—North-western Australia, Northern Territory of South Australia.

THIS very distinct species was discovered by the late Mr. M. Elsey, who was Surgeon and Naturalist attached to the Exploring Expedition in Northern and North-western Australia, under the command of Mr. A. C. Gregory. Writing of this species from the Victoria River Dépôt, in June, 1856, Mr. Elsey remarks:—"It lives in the mangroves, and may be recognised at all times by its pretty little piping note. I found it nesting in November, and again in February and March; the nest is an open, shallow, slightly constructed one; the eggs two in number, dull greenish-grey, speckled with brown, mostly at the larger end."

Specimens were obtained by Mr. E. J. Cairn and the late Mr. T. H. Bowyer-Bower at Derby, North-western Australia, in 1886, and Mr. G. A. Kearland shot several birds in the same locality during the stay there of the Calvert Exploring Expedition.

Adult males from Derby, North-western Australia, have the upper parts, wings, and tail slightly duller in colour than an example obtained on the Daly River, in the Northern Territory of South Australia. A male from Derby, in not quite adult plumage, has the apical portion of the outer webs and tips of the outer secondaries more broadly margined with white, the innermost secondaries are brown, the lateral tail feathers have smaller white tips, and the central pair only a dull white spot near the end of the shaft. The wing-measurement of adult males varies from 3.35 to 3.55 inches.

Mr. G. A. Kearland has kindly favoured me with the following notes:—"Pecilodryas cerviniventris I found generally in pairs amongst the dense mangrove thickets on the margin of the Fitzroy River in North-western Australia. In habits it bears a strong resemblance to *Eopsaltria australis*, hopping over the ground, or clinging to the trunk of a tree whilst it extracts insects from crevices in the bark, then flying to a neighbouring branch and perching in an erect attitude, but with the wings slightly drooping and the tail in a nearly horizontal position. These Robins are very tame and easily approached. I saw a pair feeding two young ones which were unable to fly, and although I was standing within six yards of them, the old birds continued to supply their wants regardless of my presence. The sexes are alike in plumage, and the young ones present but slight variation from their parents."

Mr. Charles French, Junr., received a nest and two eggs of this species, together with a skin of the bird that was procured near the Daly River, in the Northern Territory of South Australia. These Mr. French kindly sent me for description, and presented the skin and nest to the Trustees of the Australian Museum. The nest is a thick-rimmed shallow cup-shaped structure, externally formed of thin plant-stalks and fine spiral vine tendrils, the inside being lined with a few dried grass stems and a quantity of black vegetable fibre resembling horse-hair. It averages externally three inches in diameter by one inch and three-quarters in depth, the inner cup measuring nearly two inches in diameter by one inch and a quarter in depth, and was built at the junction of a forked horizontal branch of a mangrove. The eggs are oval in form, the shell being close-grained, smooth, and lustreless. They are of a faint yellowish-green ground colour, one specimen having a band of confluent blotches around the thicker end of pale ochraceous-brown and dull chestnut-red; the other has the markings, which are of a rich purplish-red, smaller and more evenly distributed over the surface of the shell, also a few underlying spots of much paler shades of the same colour:—Length (A) 0.75 × 0.58 inches; (B) 0.72 × 0.6 inches. Another nest recently received from Mr. French, that was taken in the same locality, is a flimsily built structure, formed of thin plant stems, lined with dried grasses, and is placed in a three-pronged and nearly upright fork at the end of a thin branch. It contained two eggs somewhat similar to those previously described, but much duller in colour,

particularly one specimen on which the markings are almost obsolete. Length:—(A) 0.79 × 0.55 inches; (B) 0.8 × 0.56 inches.

The breeding season of this species apparently extends over several months, as Mr. Elsey found it nesting in November and again in February and March. Mr. Keartland observed young birds that had recently left the nest, being fed near the Fitzroy River on the 1st January, 1897; and the above described eggs from the Northern Territory, which were fresh, were taken respectively on the 17th January, 1902, and the 6th January, 1903.

Pœcilodryas superciliosa.

WHITE-EYEBROWED ROBIN.

Petroica superciliosa, Gould, Proc. Zool. Soc., 1846, p. 106; *id.*, Bds. Austr., fol., Vol. III., pl. 9 (1848).

Pœcilodryas superciliosa, Gould, Handbk. Bds. Austr., Vol. I., p. 289 (1865); Sharpe, Cat. Bds Brit. Mus., Vol. IV., p. 242 (1879).

ADULT MALE—*General colour above brown, the head slightly darker; lesser and median wing-coverts like the back, the greater coverts blackish-brown with small and very narrow white edges to the tips of some of the feathers; primary coverts blackish-brown; quills blackish-brown, paler towards the tips, and crossed near the base with a conspicuous white band, the apical portion of the primaries and outermost secondaries externally edged with white, the latter also tipped with white, innermost secondaries brown like the back; tail feathers brown, all but the central pair tipped with white, more broadly towards the outermost feathers; a broad line extending from the nostril over the eye white; in front of the eye a blackish spot; below the eye a larger spot of dull white; ear-coverts dark brown, with dull white shaft streaks and bases; chin, throat, and sides of the neck white; remainder of the under surface dull white, with an ashy shade which is more pronounced on the fore-neck and upper portion of the breast; under tail-coverts white; bill black; legs and feet dark greyish-black. Total length 5.8 inches, wing 3.2, tail 2.6, bill 0.55, tarsus 0.8.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution. North-eastern Queensland.

THE present species is an inhabitant of the dense scrubs extending from the coast to the Great Dividing Range, in the central portion of North-eastern Queensland. Gilbert, who accompanied Dr. Leichhardt on his overland expedition, discovered it on the 14th May, 1845, in the scrubs on the banks of the Burdekin River, between the Sea-view Range and the Great Dividing Range, and some little distance to the north of the Valley of Lagoons. In the same district, and on the coastal side of the Sea-view Range, near Cardwell, the late Mr. Edward Spalding obtained specimens, also the nests with eggs, in 1867. Mr. J. A. Boyd found it breeding at Ripple Creek, near the mouth of the Herbert River, and kindly forwarded me its nest and eggs; and there are two specimens in the Australian Museum collection that were obtained in the neighbourhood of Port Denison.

Pœcilodryas superciliosa has also been recorded as occurring at the Gulf of Carpentaria and the Northern Territory of South Australia, but on what authority I know not. Neither of the large collections made in the former district by Mr. Gulliver and Mr. Broadbent contained examples of this species, neither was it met with by Mr. Alex. Morton at Port Essington, or by the late Mr. Spalding at Port Darwin.

The nest is an open cup-shaped structure, built over the junction of a forked horizontal branch. Externally it is formed of thin dried plant stems and dried grass stalks, slightly held together with cobweb, the inside being lined with fine vegetable fibre; the rim, which is very thick, and the exposed portion of the nest having a few large pieces of bark attached here

and there. Externally it measures three inches and a quarter in diameter by one inch and a quarter in depth, and the inner cup two inches in diameter by one inch in depth. Another nest has a few pieces of moss worked into the outer portion of the structure, and a quantity of cobweb where it is attached at the sides to a thin forked horizontal branch.

The eggs are two in number for a sitting, oval, slightly compressed oval, and elongate-oval in form, the shell being close-grained, smooth, and lustreless. In ground colour they vary from pale yellowish-green to bluish-green and greenish-grey, which is spotted and blotched with different shades varying from pale yellowish and chestnut-brown to reddish and purplish-brown, with which are intermingled similar underlying markings of purplish-grey. In some specimens the spots and blotches are evenly distributed, others have them blurred and forming confluent patches at one end or side of the shell, or few and very distinct, forming an irregular shaped zone on the thicker end. Two sets, taken by Mr. Spalding near Cardwell, in 1867, who obtained the birds at the same time, measure respectively, 1:—(A) 0.78×0.57 inches; (B) 0.77×0.57 inches; 2:—(A) 0.8×0.55 inches; (B) 0.9×0.55 inches. A set taken on the 25th November, 1892, by Mr. Boyd at Ripple Creek, near the mouth of the Herbert River, measures:—(A) 0.77×0.58 inches; (B) 0.75×0.55 inches.

Pœcilodryas capito.

LARGE-HEADED ROBIN.

Eopsaltria capito, Gould, Proc. Zool. Soc., 1851, p. 285; *id.*, Handbk. Bds. Austr., Vol. I., p. 297 (1865); *id.*, Bds. Austr., fol., Suppl., pl. 17 (1869); North, Proc. Linn. Soc. N.S.W., 2nd ser., Vol. II., p. 146 (1888).

Pœcilodryas capito, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 245 (1879).

ADULT MALE—*General colour above olive-green; upper wing-coverts like the back; quills and tail-feathers dusky brown, externally edged with olive-green; head dark greyish-brown, washed with olive-green; lores and feathers in front of the eye white; ear-coverts brownish-grey with narrow white shaft lines; chin and upper part of the throat greyish-white; remainder of the under surface yellow, strongly washed with olive-green on the sides of the breast and flanks; bill black; legs and feet flesh colour; iris brown. Total length 5 inches, wing 3.15, tail 2.3, bill 0.45, tarsus 0.75.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—South-eastern Queensland, North-eastern New South Wales.

THE brushes of the northern coastal rivers of New South Wales and the south-eastern portion of Queensland forms the stronghold of the present species. Rockingham Bay and the Bellender Ker Range have also been included in its habitat, instead of, I believe, for the following species, *Pœcilodryas nana*. It is remarkable, that if *P. capito* inhabits the latter range it was not met with by Messrs. E. J. Cairn and R. Grant during their two collecting trips in 1888-9. *P. nana*, on the other hand, was common there, and as far north as the Bloomfield River District, where, during a twelve years' residence, Mr. Frank Hislop informs me that he never met with *P. capito*. So far as the latter species is represented in the Australian Museum collection, the most northern locality from which any of the specimens was obtained is the Coomeri River, to the north of Moreton Bay.

In New South Wales, the Large-headed Robin is restricted to the rich coastal brushes and contiguous mountain ranges from the neighbourhood of the Manning River to the northern boundary of the State. Mr. R. Grant found it freely dispersed in the scrubs of the Bellinger River; I observed it farther north, but in decreased numbers, during a visit to the Upper Clarence District, where it has been found breeding by Mr. George Savidge. It is also fairly numerous in the brushes of the Richmond, Brunswick, and Tweed Rivers.

In its actions the Large-headed Robin closely resembles *Eopsaltria australis*, clinging sideways to the tree-trunks, and turning round its head to watch an intruder. In the Upper Clarence District, it was only seen in the dense and luxuriant vegetation of the brush-covered creeks and never in the partially cleared or open forest lands.

The nest is a cup-shaped structure, formed throughout of dried strips of lawyer vine leaves, fibre, and thin scales of bark, bound round and held together with spiders' webs, and externally coated with green mosses, decorated here and there with pieces of lichen. An average nest measures two inches and three-quarters in outer diameter by two inches and a half in depth, the inner cup measuring one inch and three-quarters in diameter by one inch and a half in depth. It is generally built in the angle formed by the upright stem and the projecting leaves of a lawyer-vine, sometimes at the junction of a horizontal forked vine, and occasionally in the forked upright branch of a low tree.

The eggs are usually two in number for a sitting, oval or rounded oval in form, the shell being close-grained, smooth, and slightly lustrous. Typically they vary in ground colour from a very faint greenish-white to pale green, which is freckled, spotted, or blotched with yellowish-brown, wood-brown, or chestnut-brown, the markings in some specimens being fleecy, clouded, and indistinct, in others being well defined and in strong contrast to the ground colour. As a rule they predominate on the thicker end where a more or less well defined zone is sometimes formed. A set of two, taken by Mr. G. Savidge, measures as follows: Length (A) 0.85 x 0.62 inches; (B) 0.84 x 0.62 inches. Another set, taken on the 17th November, 1901, in the Solferino Scrub, in the Upper Clarence District, measures:—(A) 0.78 x 0.65 inches; (B) 0.8 x 0.65 inches. An egg in Mr. George Savidge's collection is slightly rounded oval in form, and of a pale bluish-white ground colour, which is distinctly spotted and blotched around the larger end with purplish-brown, intermingled with smaller and fainter underlying markings of the same colour; over the remainder of the shell are scattered irregular-shaped dots and blotches of light umber-brown, with here and there a small dark purplish-brown spot. Length 0.75 x 0.59 inches. In the same nest with this egg was also taken a very well marked egg of the Square-tailed Cuckoo.

Immature birds have the feathers of the head dull rufous-brown, and some of the feathers of the back, rump, throat, and fore-neck tipped with the same colour.

September and the three following months constitute the usual breeding season of this species.

Pœcilodryas nana.

RUFIOUS-LORED ROBIN.

Eopsaltria nana, Ramsay, Proc. Linn. Soc. N.S.W., Vol. II., p. 372 (1877).

Pœcilodryas nana, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 246 (1879).

ADULT MALE—*General colour above olive green; head and hind-neck dark brown; upper wing-coverts like the back; quills dark brown, externally edged with olive green; tail feathers dark brown narrowly margined with olive-green on their outer webs and indistinctly edged with white at the tips; lores white washed with rufous, the latter colour becoming more pronounced on the feathers in front of and a ring almost surrounding the eye; ear-coverts brown; throat and fore-neck white; remainder of the under surface yellow, washed with olive-green on the sides of the breast and flanks; under tail-coverts yellow, slightly tinged with buff; bill black; legs and feet flesh colour; iris brown. Total length 4.5 inches, wing 2.9, tail 1.95, bill 0.75, tarsus 0.75.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—North-eastern Queensland.

THE known range of the present species extends from the neighbourhood of the Bloomfield River in North-eastern Queensland, as far south as the Herbert River District. It frequents alike the dense coastal scrubs and the undergrowth at all levels to the top of the contiguous mountain ranges. Dr. Ramsay described it, also its nest and eggs, from specimens procured by Mr. Kendal Broadbent near Cairns.

In the "Catalogue of Birds in the British Museum," Dr. Sharpe makes the following observations on *Pacilodryas nana*:—"Mr. Ramsay speaks of having seen a good many specimens of this supposed new species. Mr. Godman's collection contains a single example, which has the loreal spot white, with the eye ring only tinged with rufous, which also pervades the cheeks and chin. This would seem to indicate that the rufous tinge is a sign of immaturity; and the species is certainly doubtful." *Pacilodryas nana*, however, is a valid species. It is the northern representative of *P. capito*, with which it does not intergrade, and may be distinguished from that species, in addition to the rufous spot in front, and ring of feathers partially encircling the eye, by the white or greyish-white feathers of the throat, extending on to the fore-neck, and by the head and hind-neck being dark brown, and destitute of the slight olive-green wash which extends from the back on to the feathers of the hind-neck and head of *P. capito*. In ten adult specimens now before me, the specific characters pointed out by Dr. Ramsay are constant, and it is unquestionably a good and distinct species.

Mr. Frank Hislop writes me as follows:—" *Pacilodryas nana* is very common in the scrubs of the Bloomfield River District, North-eastern Queensland, frequenting the flats and all localities right up to the summits of the mountain range. It builds its nest sometimes in the fork of a sapling, but more often on a young lawyer-vine, the nest being placed in the angle formed by the leaves growing out of an upright stalk. It is a cup-shaped structure, formed of pieces of dead lawyer-vine leaves and strips of fibre, and the outside is often covered with green moss. Two eggs are usually laid for a sitting. It breeds during the months of October, November, and December."

The nest is a small open cup-shaped structure, formed of strips of dried leaves, or shreds of bark, held together with spider's webs and neatly lined inside with the fibre of the lawyer-vine, and at the bottom with portions of dried lawyer-vine leaves. Externally it is decorated with large scales of bark and pieces of green moss. An average nest measures two inches and a half in external diameter by two inches and a quarter in depth, the inner cup measuring one inch and three-quarters in diameter by one inch and a half in depth. It resembles very much the nest of *Eopsaltria chrysorrhous*, and is usually built in the same situation against the stem of a lawyer-vine, the bottom of it being supported by the leaves. The external shape of the nest, however, varies according to its situation, some nests being nearly flat and slightly wider at the base than at the rim.

Eggs two in number for a sitting, oval or elongate oval in form, the shell being close-grained, smooth, and almost lustreless. The ground colour varies from pale green to greenish-grey and faint yellowish-brown, which is freckled, dotted, and spotted with different shades, varying from yellowish-umber to reddish and chestnut-brown, intermingled with underlying spots of violet-grey, the markings predominating as usual on the thicker end, where in some specimens they assume the form of a more or less well defined zone. These eggs bear a strong resemblance to those of *Pacilodryas capito*. A set of two measures:—(A) 0.85×0.58 inches; (B) 0.85×0.56 inches. Another set measures:—(A) 0.8×0.6 inches; (B) 0.82×0.62 inches.

* Cat. Bds. Brit. Mus., Vol. iv., p. 247 (1879).

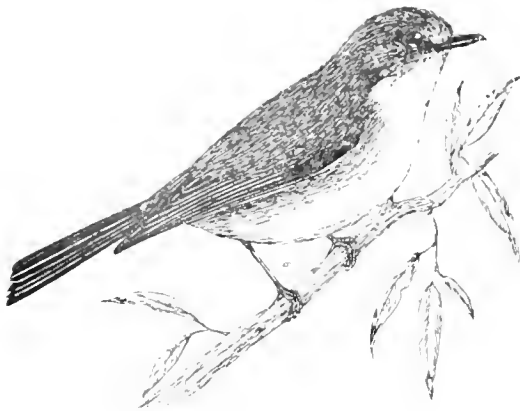
Genus *EOPSALTRIA*, Gould.*Eopsaltria australis*.

YELLOW-BREASTED ROBIN.

Muscicapa australis, Lath., Ind. Orn., Suppl., p. 1., (1801).

Eopsaltria australis, Gould, Handbk. Bds. Austr., Vol. I., p. 293 (1865); Gadow, Cat. Bds. Brit. Mus., Vol. VIII., p. 176 (1883), (part).

ADULT MALE—General colour above dark grey, strongly washed with olive on the lower back and rump; upper tail-coverts olive-yellow; lesser and median wing-coverts dark grey, the greater coverts blackish-brown; primary coverts blackish-brown; quills dark greyish-brown, the secondaries externally edged with olive, the basal portion of the inner webs of the innermost primaries and the outermost secondaries crossed with a dull white band; tail dark greyish-brown, the central feathers margined externally with olive, and the lateral feathers narrowly tipped with white on their inner webs; feathers in front of the eye blackish. chin and upper part of the throat greyish-white; remainder of the under surface bright yellow, washed with olive on the sides of the breast and flanks; bill black; legs and feet brownish-grey. iris brownish-black. Total length in the flesh 6·5 inches, wing 4·5, tail 2·8, bill 0·55, tarsus 0·9.



YELLOW-BREASTED ROBIN.

ADULT FEMALE—Similar in plumage to the male, but having the upper tail-coverts and under surface slightly duller in colour.

Distribution.—New South Wales, Victoria.

IN suitable localities the range of this familiar and well known resident extends over the greater portion of South-eastern Australia. It frequents the coastal brushes, humid scrubs, and undergrowth of mountain ranges, and is also found in orchards, large gardens, and shrubberies. In the neighbourhood of Sydney it is very common, and a few pairs breed every year in the Botanic Gardens and the Domain. Usually it is met with in

pairs, resorting chiefly to the branches or stems of low trees, as well as the ground in open parts of the scrub. When disturbed it merely flits from tree to tree, often perching transversely against the trunk and calmly watching the intruder, at the same time repeatedly jerking its tail upwards. Frequently it will remain in this position for some time, leaving perhaps to secure some insect in the grass, and returning afterwards to the same place. About orchards and gardens it becomes remarkably tame, and when one is engaged in digging will perch on some neighbouring post or limb only a few yards away, watching intently for any unearthed grub, which it quickly darts upon and carries away to devour at leisure.

The food of this species consists principally of insects and their larvæ. I have also seen it eat cold roast mutton fat.

In the bright clear days at the latter end of winter and early spring, the piping but somewhat monotonous call-note of the Yellow-breasted Robin may be heard, more especially in the early morning and again just about dusk; during the summer months it is remarkably soft and low. Sometimes it also utters a low "churp churp," when its nest is approached, resembling some of the notes of the introduced House Sparrow (*Passer domesticus*).

The nest is a round cup-shaped structure, outwardly formed of strips of bark and grasses, and lined inside with fibrous roots or the narrow thread-like leaves of the *Casuarina*, and has generally two or three dried *Eucalyptus* leaves placed at the bottom. The rim and outside is ornamented with pieces of lichen, and long pieces of bark attached by means of cobwebs hang perpendicularly round it like a heavy fringe. Some nests have only a few scales of bark on the outside and are more highly decorated with lichens. An average nest measures externally three inches in diameter by a depth of two inches and a half, and is built on a horizontal branch or in the upright fork of a low tree. Near Sydney, tea-trees, gums, turpentine, and honeysuckles are more often resorted to as nesting-sites, and sometimes it is placed on the top of a large seed-cone of the latter tree. I have also seen it built against the bare upright stem of a *Lantana* bush, supported by a thin twig. About parks and gardens they may be found almost in any tree, but a favourite situation is on the top of the midrib of the broad leaf of the Norfolk Island Pine (*Araucaria excelsa*), and often on one overhanging a well frequented path. The nests are usually built from five to fifteen feet from the ground, but if repeatedly taken, I have known them to be placed on the horizontal branch of a *Eucalyptus*, or near the top of a *Syncarpia*, at an altitude of fully thirty feet. In localities unfrequented by bird-nesting

boys, I have generally found them within hand's reach, and in one instance in a stunted gum-sapling within eighteen inches of the ground.



NEST AND EGGS OF YELLOW-BREASTED ROBIN.

The eggs are usually three, sometimes two, and occasionally four in number for a sitting, and vary considerably in colour and disposition of their markings. Typically they are oval or rounded-oval in form, the shell being close-grained, smooth, and lustrous. The ground colour varies from pale apple-green to greenish-blue, some specimens being more or less distinctly tinged with olive, and which is usually freckled,

spotted, or blotched with reddish or chestnut-brown, intermingled with a few underlying markings of paler tints. Some are distinctly and evenly marked over the shell, others have a well defined cap or zone on the larger end, formed of confluent blotches, and but sparingly marked on the remainder of its surface. Occasionally the ground colour is almost obscured with indistinct fine fleecy markings of dull reddish or yellowish-brown, like some varieties of the eggs of *Lalage tricolor*; and one set, taken by me on the 11th August, 1889, at Ashfield, has broad and distinct dull reddish-brown bands on the larger ends, the pale apple-green ground colour (except on the smaller ends) also being suffused with this colour. A set of four, taken at Canterbury, near Sydney, on the 18th September, 1896, measures:—(A) 0.92×0.66 inches; (B) 0.93×0.66 inches; (C) 0.9×0.67 inches; (D) 0.92×0.67 inches. A set of three from Roseville, on the 19th October, 1901, measures:—(A) 0.83×0.63 inches; (B) 0.82×0.65 inches; (C) 0.8×0.66 inches. A set of two, taken by me at Gerringong on the 13th October, 1889, measures:—(A) 0.74×0.63 inches; (B) 0.8×0.64 inches.

Fledgelings are pale rufous-brown above and below, the feathers on the upper parts having distinct whitish shaft-streaks, the yellow feathers first appearing on the throat. Young birds resemble the adults, but are mottled more or less with the rufous-brown feathers of youth until they arrive at full maturity. Wing 3·3 inches.

Eopsaltria? inornata, Ramsay, from Cardwell, the type of which is in the Australian Museum, is a good and distinct species. Dr. Gadow regards it as an apparently young bird of *Eopsaltria australis*, and erroneously places *E. inornata* as a synonym of that species. It is doubtful if it even belongs to the genus.

Two types of nests are figured, the decorations of the one represented on the preceding page consisting entirely of lichens. I found this nest, containing three fresh eggs, at Roseville, on the 21st October, 1901. It was built in a geebung, about five feet from the ground. This nest, which I photographed to show its inner lining of leaves of *Casuarina suberosa* and outer decorations, was only about fifty yards away from the nest represented on Plate A. 3. The latter, which contained two fresh eggs, I found on the 6th August, 1898, and it was built in a Forest Oak (*Casuarina suberosa*) at a height of twenty feet from the ground. It measures externally three inches and a quarter in diameter by a depth from the rim to the base of the nest proper of three inches and a half. The pieces of bark attached to the outside are longer than usual, the nest and its appendages measuring altogether in height six inches. The inner cup, which is lined almost entirely with the narrow leaves of *Angophora lanceolata*, measures two inches and three-quarters in diameter by one inch and three-quarters in depth.

Generally the female slips off the nest unobserved, but if it contains incubated eggs or young birds, she will often remain sitting till one gets within a few feet, and sometimes will allow herself to be touched before she forsakes her charge. On one occasion I saw a pair of these birds clinging to the trunk of a tree within a few feet of the ground. Both had their wings and tail outspread, and which they worked in a tremulous manner. They persisted in this action for nearly five minutes, without uttering a sound, until I began to search for the nest, which I discovered in a tree close by, containing two young ones. I also observed a female act in a similar manner while sitting on a nest, but in this instance my attention was attracted to it by the bird's low plaintive note. Another nest I found at Roseville, on the 28th August, 1898, containing two young ones, was built in a *Casuarina*, seven feet from the ground. On my approaching near it the parents puffed out their feathers and resembled balls as they rolled about the ground just in front of me in the hopes of alluring me away. This common device of birds is very rarely resorted to by this species.

During the winter of 1902—a year of unprecedented drought—a pair of these birds visited my house daily to pick up any scraps thrown to them. They were absent for some time, but returned again early in October, accompanied by two young ones. Again presumably the same pair visited the garden and fences surrounding the house in January, accompanied by two young ones; they remained for three weeks, during which time the latter assumed the yellow under surface like the adults, with the exception of a few rufous-brown feathers. All the nests of this species I examined during 1902, contained only two eggs or two young ones.

Nidification usually commences the first week in July, sometimes in June, the nest taking about a week to build, and the eggs are deposited on each successive day. Two or three broods are reared during the breeding season, which continues until the end of January.

Eopsaltria chrysorrhous.

GOLDEN-RUMPED ROBIN.

Eopsaltria australis, Gould, Bds. Austr., fol., Vol. III., pl. 11 (1848); Ramsay, Proc. Zool. Soc., 1868, p. 384.

Eopsaltria chrysorrhous, Gould, Ann. & Mag. Nat. Hist., Ser. 4, Vol. IV., p. 109 (1869).

Eopsaltria magnirostris, (Rams. et lit.), Gould, Ann. & Mag. Nat. Hist., Ser. 4, Vol. IV., p. 109 (1869).

ADULT MALE—Like the adult male of *EOPSALTRIA AUSTRALIS*, but devoid of the olive wash on the breast and upper tail-coverts, these parts being of a clear rich yellow. Total length 6·75 inches, wing 3·7, tail 2·9, bill 0·6, tarsus 0·95.

ADULT FEMALE—Similar in plumage to the male, but slightly smaller and duller in colour.

Distribution.—Eastern Queensland, Northern Coastal Districts of New South Wales.

GOULD separated this bird from the preceding species on account of its slightly larger size, and in having the breast and rump of a jonquil-yellow. Its habitat is given as the eastern portion of New South Wales and southern portion of Queensland. It will be found, as a rule, in Australia, that the farther north in the coastal districts examples of a species are



NEST OF GOLDEN-RUMPED ROBIN.

obtained, the brighter they are in colour. This only partially holds good in the present instance, for while typical examples of *Eopsaltria australis*, obtained near Sydney, may easily be distinguished from the brighter coloured race inhabiting parts of the Upper Richmond River, New South Wales, and the brushes of the Brisbane River, Queensland, some of the latter are as brilliant in colour as specimens obtained at Cardwell and Cairns, in the north-eastern portion of that State. One of the characters pointed out by Gould,* that the birds from Rockingham Bay—separated by Dr. Ramsay under the MS. name of *E. magnirostris*—have conspicuously larger bills and shorter wings than the bird distinguished by himself under the name of *E. chrysorrhous*, is not constant. An adult male of the latter from the Brisbane River, near where Gould's types were obtained, measures respectively:—wing 3·6 inches, bill

0·5 inches; of the type of *E. magnirostris*, wing 3·6 inches, bill 0·55. There is no question that the birds from some parts of the northern rivers of New South Wales and Eastern Queensland, lose the olive wash on the breast and upper tail-coverts, and have those parts of a richer and clearer yellow. Dr. Gadow, however, in the "Catalogue of Birds in the British Museum,"† who has had the advantage of examining Gould's type of *E. chrysorrhous*, relegates this name

* Ann. Mag. Nat. Hist., Ser. 4, Vol. iv., p. 109 (1869).

† Cat. Bds. Brit. Mus., Vol. viii., p. 177 (1883).

also that of *E. magnirostris*: as synonyms of *E. australis*. It is a matter of opinion whether he is right in so doing. Possibly the type of *E. chrysorhous*, to which species Dr. Ramsay first drew attention, may be only a brighter coloured northern race of *E. australis*, due to climatic variation, but if it is as rich in colour as Dr. Ramsay's type from Cardwell, under the MS. name of *E. magnirostris*, now before me, I hold that it is more entitled to recognition than many others which are accorded full specific rank.

The nest of *Eopsaltria chrysorhous* is formed chiefly of the skeletons of leaves and portions of the dead leaves of the lawyer-vine (*Calamus australis*), the exterior being covered with fine green moss held in position with a thin network of spider's web, to which is attached here and there pieces of pale greenish-grey lichen; inside it is lined with strips of dead leaves of the lawyer-vine and fibre. An average nest measures externally three inches in diameter by two inches and three-quarters in depth, and the inner cup two inches and a quarter in diameter by two inches in depth. The nest figured was taken by Mr. H. R. Elvery, near Ballina, and is built close to the base of some leaves growing on the upper portion of a stem of a lawyer-vine, to which it is attached by spider's web. The eggs are two in number for a sitting, and typically are not to be distinguished from those of *Eopsaltria australis*. A set of two, taken in the Tweed River District, near the Queensland border, are oval in form, and of a dull green ground colour, which is uniformly freckled and blotched with dull yellow and reddish-brown. Length: (A) 0.88 × 0.7 inches; (B) 0.88 × 0.68 inches. Four eggs, taken by Mr. Elvery from a nest on the 10th September, 1898, and which only contained a single egg on the 17th inst., is apparently the result of two birds laying in the same nest, for they are of two distinct types, and vary considerably in colour, disposition of markings, and size. Length: (A) 0.9 × 0.69 inches; (B) 0.87 × 0.73 inches; (C) 0.91 × 0.66 inches; (D) 0.9 × 0.65 inches. Another set of two, taken near Lismore, is of a rich greenish-blue ground colour, which is freckled and spotted but particularly on the larger end with purplish-red. Length: (A) 0.88 × 0.63 inches; (B) 0.92 × 0.63 inches.

***Eopsaltria gularis*.**

GREY-BREASTED ROBIN.

Gobe-mouche à gorge blanche, Quoy et Gaim., Voy. de l'Astrol., Atlas, pl. 4, fig. 1.

Muscicapa gularis, Quoy et Gaim., Voy. de l'Astrol., Zool., Tom. I., p. 176 (1830).

Eopsaltria griseogularis, Gould, Proc. Zool. Soc., 1837, p. 144; *id.*, Bds. Austr., fol., Vol. III., pl. 12 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 294 (1865).

Eopsaltria georgiana (nec Quoy et Gaim.), Gadow, Cat. Bds. Brit. Mus., Vol. VIII., p. 178 (1883).

Eopsaltria gularis, North, Proc. Linn. Soc. N.S.W., 2nd ser., Vol. XXVII., p. 76 (1902).

ADULT MALE—*General colour above ashy-grey, the lower back tinged with olive-yellow; rump and upper tail-coverts olive-yellow; quills dark brown externally edged with grey; tail-feathers dark brown, externally washed with olive-yellow, the lateral feathers tipped with white; lores blackish; chin, throat, and fore-neck white; upper portion of the breast grey; remainder of the under surface bright yellow; "bill black; legs and feet black; iris dark brown;"* (Morgan). *Total length 5.7 inches, wing 3.5, tail 2.6, bill 0.5, tarsus 0.85.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Western Australia, South Australia.

THE type of the present species was figured and described by MM. Quoy and Gaimard from a specimen collected at King George's Sound, Western Australia, during the "Voyage of the Astrolabe." Subsequently Gould described and figured the same species under the name of *Eopsaltria griseogularis*, from a specimen in a collection at Fort Pitt,

* Proc. Zool. Soc., 1868, p. 384.

Chatham, obtained at Swan River. In his "Handbook to the Birds of Australia," Gould erroneously placed *Muscicapa georgiana*, Quoy and Gaimard, as a synonym of *Eopsaltria griseogularis*, Gould, and also errs in placing *Muscicapa gularis*, Quoy and Gaimard, as a synonym of his *Eopsaltria leucogaster*. Dr. Gadow in the "Catalogue of Birds in the British Museum,"[†] has also confused the two, describing *E. gularis* under the name of *E. georgiana*, and the latter species under the name of the former. In addition to the description of these two birds appearing under the wrong names, the synonymy is incorrect, *Eopsaltria griseogularis*, Gould, appearing as a synonym of *E. georgiana*, and *E. leucogaster*, Gould, as a synonym of *E. gularis*.

Mr. George Masters obtained specimens of *Eopsaltria gularis* in the mangroves about a mile from Port Lincoln, South Australia, during the latter part of 1865; also at King George's Sound, Western Australia, in 1866, and again in 1868, when he also procured several of its nests and eggs. He informs me that in the latter locality he found this species frequenting similar situations as *E. australis* does in Eastern Australia, which in habits it resembles. I also received for examination a mutilated specimen of a young bird referable to this species, that was shot by Mr. Tom Carter in the mangroves at Point Cloates, North-western Australia, on the 23rd February, 1902.

Specimens from Port Lincoln have the upper tail-coverts of a duller olive-green, and the band on the upper breast broader and slightly darker than in western examples. Variation also exists in the specimens from King George's Sound. Some have the white chin and throat sharply defined and well separated from the yellow lower breast by a grey band on the fore-neck and upper portion of the breast; in others the white extends on to the sides of the neck, and in one specimen the yellow feathers of the breast meet the white feathers on the fore-neck. The wing-measurement of adult males varies from 3.4 to 3.7 inches.

In a collection of birds sent me for examination, and formed by Dr. A. M. Morgan and Dr. A. Chenery during a trip made from Port Augusta to the Gawler Ranges in August, 1902, was an adult male and female of this species. Dr. Morgan writes:—"These birds were not seen until past Yardea, where they were common in a patch of mallee scrub and in the deep gorges. They were only found where there were *Eucalypti*."

Mr. J. W. Mellor, of South Australia, writes:—"I first observed the Grey-breasted Robin at Kapinka, about twenty miles north-west of Port Lincoln, where I obtained both adults and young. They seem to prefer the wooded hill country with an undergrowth. Two eggs is the usual number, I believe, laid for a sitting, for prior to my visit I had two sets sent me, and on several occasions I saw the old birds feeding two young ones. They are apparently moderately early breeders, for I shot two young birds that were being fed by the parents on the 29th September."

The nest of this species cannot be distinguished from that of *Eopsaltria australis*. It is an open cup-shaped structure, formed entirely of strips of bark bound round and held together with cobwebs, the bottom of the nest being lined with dried gum leaves. On the outside are attached by cobwebs long strips of bark which hang around the nest like a heavy fringe. An average nest, taken by Mr. George Masters on the 24th September, 1868, measures externally three inches in diameter by two inches in depth, and the inner cup two inches and a half in diameter by one inch and a half in depth. From the rim to the lower end of the longest piece of suspended bark it measures four and a quarter inches.

Eggs two in number for a sitting, oval or elongate-oval in form, and varying in ground colour from dull apple-green to pale yellowish-green, which is dotted, spotted, or heavily

* Handbk. Bds. Austr., Vol. i., p. 294 (1865).

† Cat. Bds. Brit. Mus., Vol. viii., p. 178 (1883).

blotched with different shades of chestnut, red, or brown. In some specimens the markings are faint and nearly obsolete, in others they are bold and well defined; but as a rule they predominate on the thicker end where they form a more or less well defined zone. If a large series is examined, they will probably be found to vary as much in colour and markings as those of *Eopsaltria australis*, for Gilbert describes them as being of a wood-brown, obscurely freckled with yellowish-red. A set of two measures:—Length (A) 0.84×0.62 inches; (B) 0.83×0.6 inches. Another set measures:—(A) 0.79×0.6 inches; (B) 0.8×0.61 inches.

Eopsaltria georgiana.

WHITE-BELLIED ROBIN.

Gobe-mouche georgien, Quoy et Gaim., Voy. de l'Astrol., Atlas, pl. 3, fig. 4.

Muscicapa georgiana, Quoy et Gaim., Voy. de l'Astrol., Zool., Tom. I., p. 175 (1830).

Eopsaltria leucogaster, Gould, Proc. Zool. Soc., 1846, p. 19; *id.*, Bds. Austr., fol., Vol. III., pl. 13 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 296 (1865).

Eopsaltria gularis, (nec Quoy et Gaim.), Gadow, Cat. Bds. Brit. Mus., Vol. VIII., p. 181 (1883).

Eopsaltria georgiana, North, Proc. Linn. Soc. N.S.W., 2nd ser., Vol. XXVII., p. 75 (1902).

ADULT MALE—*General colour above dark slaty-grey; lesser wing coverts like the back, the median and greater coverts blackish-brown; edge of the wing white; quills blackish-brown with a white bar near the base of their inner webs, excepting on the outermost primaries and innermost secondaries, and forming a well defined band through the wing when spread; tail-feathers dark brown, externally washed with slaty-grey, the lateral feathers tipped with white on their inner webs which increases in extent towards the outermost feather; lores and a spot in front of the eye blackish; chin and all the under surface white, the chest and sides of the breast tinged with grey; bill blackish-brown; legs and feet blackish-brown; iris dark brown. Total length 5.7 inches, wing 3.1, tail 2.6, bill 0.5, tarsus 0.95.*

ADULT FEMALE—*Similar in plumage to the male but slightly smaller.*

Distribution.—Western Australia.

I HAVE here included a description of *Eopsaltria georgiana*, in order to give the synonymy of it in regard to the works referred to above. Like the preceding species, this bird was originally figured and described by MM. Quoy and Gaimard in the Atlas and Zoology of the "Voyage de l'Astrolabe." It was discovered by the early French voyagers at King George's Sound, Western Australia, and received its specific name from the locality in which it was found. As previously pointed out, the description of *E. georgiana*, in the "Catalogue of Birds in the British Museum," erroneously appears under the name of the preceding species, *E. gularis*.

Mr. George Masters, who obtained adult and young specimens at King George's Sound, in 1866, while collecting on behalf of the Trustees of the Australian Museum, informs me that he observed this species chiefly in timbered country with a light undergrowth, and that it was not so common as the preceding species, *Eopsaltria gularis*.

Immature birds have pale rufous-brown feathers with distinct white shaft stripes, intermingled with the dark slaty-grey feathers of the upper parts; wings blackish-brown, the greater wing-coverts and secondaries conspicuously tipped with white; sides of the head pale rufous-brown; lores and a spot in front of the eye blackish-brown; all the under surface dull white; the throat, fore-neck, and upper portion of the breast and flanks strongly washed with rufous-brown. Wing 3 inches.

* Cat. Bds. Brit. Mus., Vol. viii., p. 178 (1883).

Genus SMICRORNIS, Gould.

Smicrornis brevirostris.

SHORT-BILLED SCRUB-TIT.

Psilopus brevirostris, Gould, Proc. Zool. Soc., 1837, p. 147.*Smicrornis brevirostris*, Gould, Bds. Austr., fol., Vol. II., pl. 103 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 273 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 209 (1879).

ADULT MALE—General colour above dull olive tinged with yellow, which is more distinct on the lower back and rump; quills brown, externally edged with ashy-olive; upper tail-coverts olive-brown; tail feathers pale brown, crossed by a broad subterminal black band, which is almost lost on the two central feathers, the four outermost feathers having a spot of white near the tip of their inner webs; crown of the head pale brown, tinged with olive; from the nostril extending over the eye a line of dull whitish feathers; a small spot in front of the eye rufous-brown; remainder of the feathers around the eye and the ear-coverts pale rufous-brown; throat and fore-neck dull white, tinged with olive; remainder of the under surface pale yellowish-buff, becoming bright olive-yellow on the abdomen; under tail-coverts pale yellowish-buff; bill brown; feet fleshy-brown; iris straw-white. Total length in the flesh 3.5 inches, wing 2, tail 1.4, bill 0.2, tarsus 0.6.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Queensland, New South Wales, Victoria, South Australia, Western Australia.

THE two species belonging to this genus, which is confined to Australia, may be distinguished by their diminutive size and unusually short bills. The present species is widely distributed over the continent, and among specimens now before me I can find no difference between eastern and western examples. An adult male, obtained by Mr. George Masters in January, 1869, at Mongup, Salt River, Western Australia, being precisely similar in plumage to another one procured by him in August, 1870, at Gayndah on the Burnett River, Queensland. The wing-measurement of adult males varies from 1.85 to 2.05 inches. Some have narrow central brownish-black streaks on the feathers of the throat, in others they are absent.

With the exception of heavily timbered mountain ranges, and the dense coastal brushes, I have noted this species in nearly every part of New South Wales and Victoria. In the latter State it was one of the first birds I became acquainted with in my early collecting days, the belts of *Melaleuca* growing near the mouth of the Yarra River being at that time the favourite resort, among others, of two species known locally and distinguished by bird-nesting boys as the "Scrub-Tit," the present species, and the "Scrub-Wren" (*Sericornis frontalis*). In New South Wales I found it very common near Wellington and Dubbo, also in the myall scrubs on the Namoi River, its range extending through similar country into Western Queensland, from where I received its nest and eggs. Near Sydney it breeds chiefly in the open forest lands about Blacktown and Seven Hills, and in the sapling scrubs at Cabramatta, Auburn, and Belmore. It is freely distributed on the hills around Adelaide, and Dr. A. M. Morgan found it fairly common at Port Augusta in August, 1900, but not farther north. Again, in company with Dr. A. Chenery during a collecting expedition made from Port Augusta to the Gawler Ranges in August, 1902, it was observed throughout the trip wherever there were *Eucalypti*. While undoubtedly resorting to trees of larger growth, it gives decided preference for sapling scrubs and low timber.

In its actions it closely resembles the typical *Acanthiza*, clinging to the leafy sprays and diligently searching for minute insects and their larvæ. It is exceedingly tame, and if one remains perfectly still, will venture so close that I have more than once seen an attempt made to catch it in dwarf saplings with a short-handled butterfly-net.

The call-note of this species is a clear whistling double-note, remarkably loud for the size of the bird, and somewhat resembling that of the Mistletoe-bird (*Dicaeum hirundinaceum*).

The nests are small, round, oval, or pear-shaped structures, with a narrow spout-like entrance near the top, and vary in size and the materials of which they are formed according to the localities in which they are built. Usually they are outwardly constructed of fine wiry grasses, spiders' cocoons and webs, woven securely together, and lined inside with feathers or small dried flowers; in others mosses or feathers are worked into the outer walls, and I have seen them formed throughout of green grass stems, held together with spiders' web and cocoons, and without any special lining. An average one measures externally two inches and a half in diameter by three inches and a half in length, and across the spout-like entrance near the top one inch. The nests are generally attached at the back or sides to the thin leafy twigs near the top of a gum sapling, or to the thin upright rigid stems of a tea-tree, at a height varying from seven to thirty feet from the ground. At Narrabri, in November, 1896, I found them built in the low drooping leafy stems of some of the larger gum trees.

The eggs, usually two, sometimes three in number for a sitting, are oval or elongate-oval in form, the shell being close-grained, smooth, and slightly lustrous. They vary in ground colour from creamy-buff and pale vinous-brown to a dull buffy-white, which is minutely freckled either with buffy-brown, purplish-brown, or slaty-brown, the markings in some specimens being uniformly distributed over the shell, but as a rule predominating on the larger end where a more or less well defined zone is sometimes formed. Others have only an indistinct clouded zone or cap on the larger end, of a slightly darker hue than the ground colour. A set of two, taken in Central Queensland, measures as follows: Length (A) 0·61 × 0·47 inches; (B) 0·62 × 0·49 inches. A set of two, taken in New South Wales, measures: (A) 0·62 × 0·43 inches; (B) 0·6 × 0·44 inches. An elongate set measures: (A) 0·62 × 0·44 inches; (B) 0·67 × 0·43 inches. A set of three, taken in the Wimmera District, Victoria, measures:—(A) 0·53 × 0·41 inches; (B) 0·55 × 0·41 inches; (C) 0·55 × 0·42 inches.

Fledgelings assume the plumage of the adults shortly after leaving the nest.

Probably two or more broods are reared during the breeding season, which begins in July, and continues the five following months. I have taken fresh eggs as early as the 5th August, and as late as the 6th November. That they may be found much later is proved by my seeing fledgelings that had just left the nest at the end of January.

Smicrornis flavescens.

YELLOW-TINTED SCRUB-TIT.

Smicrornis flavescens, Gould, Proc. Zool. Soc., 1842, p. 131; *id.*, Bds. Austr., fol., Vol. II., pl. 104 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 274 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 210 (1879); North, Rep. Horn Sci. Exped. Central Austr., Pt. II., Zool., p. 84, (1896).

ADULT MALE.—*General colour above olive-yellow, brighter on the rump; upper tail-coverts like the back; upper wing-coverts and quills ashy-brown, margined with olive-yellow; tail feathers ashy-brown, externally edged with olive-yellow, and crossed with a subterminal black band, except on the two central feathers, the four outermost feathers with a spot of white near the tip of the inner web; crown of the head brown, washed with olive-yellow; lores and an indistinct eyebrow buffy-white; ear-coverts pale rufous-brown; feathers on the chin and upper throat pale yellowish-white; remainder of the under surface yellow, becoming a deeper yellow on the abdomen and flanks; under tail-coverts pale yellow; bill and feet pale fleshy-brown; iris straw-white. Total length 3·3 inches, wing 1·9, tail 1·3, bill 0·22, tarsus 0·55.*

ADULT FEMALE.—*Similar in plumage to the male.*

Distribution.—North-western Australia, Northern Territory of South Australia, Northern Queensland, Central Australia.

THE Yellow-tinted Scrub-Fit is the smallest bird yet found inhabiting Australia, measuring barely three inches and a quarter in length, and from 1·8 to 1·95 inches in wing-measurement. It is distributed right across the northern portion of the continent. Gilbert obtained specimens at Port Essington, and the late Mr. E. Spalding procured examples near Port Darwin. Mr. Gulliver found it near Normanton, in the Gulf District, and Mr. Munt has obtained its nest and eggs a short distance inland from Cooktown. At Derby, North-western Australia, it was obtained respectively by Mr. E. J. Cairn and the late Mr. F. H. Bowyer-Bower in 1886, and by Mr. G. A. Kearland in 1896-7 near the junction of the Fitzroy and Margaret Rivers, who also procured examples in 1894, in Central Australia, where Mr. C. E. Cowle has on several occasions taken its nests and eggs.

Relative to this species Mr. G. A. Kearland has kindly sent me the following notes:—"I first met with these little birds in the gullies of the West Macdonnell Ranges, in Central Australia, in June, 1894. They were generally found in the largest eucalyptus trees, seeming to prefer the topmost branches. Their note is very loud in proportion to the size of the bird, and they indulge in a very pretty song. Although several may be heard in a gully, it seldom happens that more than two birds are in the same tree. They are extremely active in quest of insects, etc., amongst the foliage, and keep up a constant twitter as they perform all manner of antics amongst the drooping leaves. During the latter part of my stay at the Fitzroy River, North-western Australia, in 1897, I found them under similar circumstances, but there is very little doubt that they like to be in the neighbourhood of a good water supply, as I never saw them far from either a well or the river. The sexes are alike in plumage, and I am of opinion that age makes very little difference in their appearance. I skinned one bird that I saw being fed by another. It was evidently a young one. Both fell at the one shot, and I had difficulty in deciding which was the recipient of the food until I dissected them. Their nests are usually placed in the drooping foliage of a gum or mulga."

A nest of this species, found during April, 1898, near Illamurta, Central Australia, by Mr. C. E. Cowle, is a small dome-shaped structure, with a narrow entrance protected by a hood near the top. It is compactly formed of the partially green stems of herbaceous plants intermingled with plant down, the walls and bottom being very thick, and the inside lined with the latter material and a few feathers, among them being one of *Platycercus zonarius*. It is beautifully woven together, resembling somewhat in appearance the nest of *Dicaeum hirundinaceum*, but larger, and is composed of finer materials than I have seen used by *Smicrornis brevirostris*. Externally it measures three inches and a half in height by two inches and a half in diameter, and across the narrow entrance near the top one inch. It was attached to the thin leafy stems of a mulga, at a height of four feet from the ground, and contained three fresh eggs, one of which Mr. Cowle unfortunately broke.

Eggs two or three in number for a sitting, oval or elongate oval in form, the shell being close-grained, smooth, and slightly lustrous. Two eggs of the set from the above nest, and which are now in Mr. Kearland's collection, are of a creamy-buff ground colour, one specimen having a zone of indistinct creamy-brown markings on the larger end, the other being sparingly but uniformly freckled over the shell with dull purplish-brown, the markings becoming confluent and of a faint violet shade on the larger end, where a cap is formed. They measure:—(A) 0·57 × 0·42 inches; (B) 0·57 × 0·42 inches. Another egg, taken at Illamurta, by Mr. Cowle, from a nest built in a gum sapling measures 0·6 × 0·47 inches. A set of two eggs in Mr. J. Gabriel's collection, also taken by Mr. Cowle in Central Australia, measures:—(A) 0·58 × 0·42 inches; (B) 0·58 × 0·43 inches.

Genus **GERYGONE**, Gould**Gerygone albigularis.**

WHITE-THROATED BUSH-WARBLER.

Psilopus albogularis, Gould, Proc. Zool. Soc., 1837, p. 147.*Gerygone albogularis*, Gould, Bds. Austr., fol., Vol. II., pl. 97 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 266 (1865).*Gerygone albigularis*, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 212 (1879).

ADULT MALE—General colour above pale ashy-brown, washed with olive; lesser wing-coverts like the back, the median and greater coverts dark brown, externally edged with ashy-brown; quills dark brown, externally edged with light ashy brown; upper tail-coverts pale ashy-brown; two central tail feathers ashy-brown, with a large indistinct blackish-brown oval spot near the tip, the remainder blackish-brown with a broad white band on their inner webs near the centre of the feather and a spot of white at the tip, the apical portion of the outer web of the outermost feather white except at the tip; loreal streak white; feathers in front of the eye and the ear-coverts rich brown; cheeks and throat white; remainder of the under surface yellow; under tail-coverts yellowish-white; bill black; legs and feet blackish brown; iris light red. Total length in the flesh $4\frac{2}{3}$ inches, wing $2\frac{2}{3}$, tail $1\frac{7}{8}$, bill $0\frac{1}{4}$, tarsus $0\frac{1}{2}$.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Queensland, New South Wales, Victoria.



WHITE-THROATED BUSH-WARBLER.

THE eastern portion of the Australian continent is the habitat of this species, and in no part does it appear to be more abundantly distributed than in New South Wales. It is but sparingly dispersed in Victoria, although the first nest and eggs of this species I had seen, together with a skin of the bird, were obtained near Beechworth in November, 1880. There is considerable variation in the wing-measurement of adult specimens, even when procured in the same neighbourhood; $2\frac{2}{3}$ inches is the average, but the wing of a fine old adult male obtained at Middle Harbour, Sydney, measures only $2\frac{1}{5}$ inches; of another, procured at Ashfield, $2\frac{4}{5}$ inches. Specimens from the Burnett River and Rockingham Bay, Queensland, are similar

in colour and average measurements to New South Wales examples.

It is a strictly migratory species, arriving in New South Wales early in spring, remaining to breed, and leaving again in the autumn. During a period of fourteen years I have generally noted its arrival in the vicinity of Sydney between the 7th and 15th September, on the average being nearer to the earlier date. In 1902, however, a year of unprecedented drought inland, it did not arrive at Roseville until the 7th October. The time of its departure depends a great deal upon the season, generally it is during the first or second week in April, my latest record being the 21st April, 1898, the weather that year being unusually warm and mild. It frequents chiefly sapling scrubs, open forest country, and mountain ranges, and except in the arid portions I have met with it in nearly every part of the State visited.

From its sweet and pleasing note it is known in the neighbourhood of Sydney and in many parts of New South Wales as the "Native Canary." It is impossible to convey by words any idea of its clear and varied song, which is uttered at intervals throughout the day, and can be heard at a great distance. During the late spring and early summer months it

commences to sing about 5 a.m. Just prior to taking its departure, it does not sing so frequently, and usually repeats only part of its spring song.

The food of this species consists entirely of minute insects and their larvæ, which it obtains among the leaves. While engaged in its search for food it is quite unconcerned at the approach of an intruder, and frequently will utter its pleasing song while perched a few feet above one's head.

The nest is oblong-oval in form, with a narrow entrance near the top, protected with a small hood, the bottom of the nest terminating in a beard or tail several inches in length. Outwardly it is constructed of very fine strips or shreds of stringy bark, firmly interwoven with spiders' webs, and lined inside with feathers, fur, hair, or soft downy seeds. Some nests are built throughout of bark and cobwebs; others are beautifully ornamented on the outside with the pure white egg-bags of spiders, or the pale green web in which they are sometimes enveloped. As a rule, however, dull red is the prevailing colour of their nests. In one now before me several pieces of string and white worsted are worked into the front. A common decoration is the silky covering to holes in trees formed by the wood-boring larvæ of insects, and to which closely adhere small particles of wood. On some I have found pieces of kino which were probably attached to the spiders' webs when collected by the birds off the trunks of trees. One taken by me at Ashfield on the 10th November, 1890, had two entrances, one above the other; it was built near the top of a Turpentine-tree at a height of forty feet from the ground, and contained three fresh eggs on which the bird was sitting. It is remarkable, too, that nests often built near one another differ so much in the material used in their inner construction. Of two taken in close proximity, one is thickly lined with feathers the other entirely with cow-hair. The beard or tail below the nest varies considerably in length. Generally it is about three or four inches long, but a nest I found had this appendage over six inches and a half in length. The nest figured on Plate A 4, which was taken at Roseville on the 19th October, 1898, measures five inches in length by two inches and a half in breadth, the tail beneath the nest five inches, and across the aperture one inch. It was built in a Sydney Peppermint (*Eucalyptus piperita*) and contained two fresh eggs. In the neighbourhood of Sydney the nest is usually attached at the top to a thin leafy branchlet of a gum sapling or Turpentine-tree (*Syncarpia laurifolia*). Some are built within hand's reach, but generally they are from ten to twenty feet in height from the ground, and not infrequently they are found at an altitude of fully forty feet.

The nests of this species are extremely common, and fall an easy prey to bird-nesting boys, for the little builders pour forth their musical notes during the greater part of the time they are engaged in the task of nidification. A nest the writer had under daily observation near his house, was commenced early in the morning of the 28th September, 1898. At that time only a small portion of bark was placed around a thin upright leafy twig of a low sapling, at a height of five feet from the ground. Nesting material, consisting of fine strips and shreds of stringy-bark interwoven with spiders' webs was added for the two following days. It was then a long rounded pendant mass, averaging except at the bottom, two inches in diameter by nine inches in length, and without the least semblance or form of a nest. On the fourth day a neatly rounded hole was made near the top of this collection of nesting material, enabling the birds to get inside. Gradually they worked their way down the centre of the mass to the required depth, at the same time forcing out the sides until it assumed an oblong-oval form, with a few inches of superfluous nesting material remaining below the nest. Fashioning the interior, and lining it with finer strips of bark and at the bottom with feathers occupied another four days. On the 8th October, eleven days after the nest was first commenced, I flushed a bird from it, and found it contained one egg. The next day another egg was laid, and probably a third was deposited on the succeeding day, but on passing the tree that evening I

found that the nest had been torn away from the branch. The birds commenced at once to build in another sapling near at hand, but forsook it two days afterwards, and selected the very same spot where their nest had been taken from a few days before. Here precisely the same nest-building operations were repeated. This nest took fourteen days to complete. On the 29th October it contained one egg, when I cut the branch on which it was built off the tree. This nest is now in the Australian Museum collection. Leaving home for a few weeks, I saw no more of this pair of birds, but was informed by Mr. C. G. Johnston that they started to build again on the next branch, which he pulled off as he knew there was not the slightest chance of their rearing any young. Finally, on their commencing to build again, he uprooted the sapling. It can only be conjectured what induced the birds to select this particular sapling after having their nests destroyed so many times, for it was surrounded for some distance by others similar to it. Probably it was due to the fact that the stem was thickly infested with scale and overrun with ants, for it is well known that this species evinces a decided preference for trees infested with these industrious insects. Subsequently I had many opportunities of watching the nest-building process, and in every instance it was similar to that previously described. These birds are not easily disturbed. A nest at Roseville I wanted to send to a friend, I removed from the branch of a sapling during a thunderstorm, believing the full number of eggs had been deposited, but found, on making a closer examination, that it contained only two. Putting a small hole through the upper portion of the structure, I passed it half way down a thin dead twig. On the following day I found one of the birds singing in the tree, but the twig had been broken off and the nest was lying on the grass, with the full complement of three perfect eggs.

The eggs are usually three, sometimes only two, in number for a sitting, oval or elongate oval in form, the shell being close-grained, and its surface smooth and lustreless. The ground colour varies from pure white to dull reddish-white, which is more or less obscured by innumerable fine freckles, dots, and irregular-shaped spots of either dull red, pinkish-red, or faint purplish-red, the markings being larger and predominating on the thicker end, where in many specimens a well defined cap or zone is sometimes formed. Two unusually marked eggs, taken from the nest figured, are pure white with a heavy zone on the larger end, formed of confluent blotches of pale purplish-red; the remainder of the shell, with the exception of a few small freckles, being devoid of markings. A set of three measures as follows:—Length (A) 0.75×0.48 inches; (B) 0.76×0.5 inches; (C) 0.75×0.49 inches. A set of two measures:—(A) 0.68×0.48 inches; (B) 0.67×0.48 inches.

Young birds resemble the adults, but have no white loreal streak; the ear-coverts are pale brown, the feathers on the forehead are washed with yellow, and the cheeks and throat are of a uniform dull yellow like the remainder of the under surface. Wing 2 inches.

In New South Wales nidification seldom commences before the middle of September, and the nest usually takes from eleven to fourteen days to complete. Both sexes work assiduously at its construction, the male stopping now and again to relieve the tediousness of nest-building with his pleasing and cheerful song. The eggs are deposited on each succeeding day, and the task of incubation occupies about twelve days. Nests containing fresh eggs are more often found in the neighbourhood of Sydney during the month of October, but I have obtained them as late as the 30th December. The female sits very close, and will occasionally allow herself to be handled, rather than forsake her eggs or young.

I have frequently taken the eggs of the Bronze Cuckoo (*Lamprolaima placens*) and the Rufous-tailed Bronze Cuckoo (*L. basalis*) from the nests of this species.

Gerygone fusca.

BROWN BUSH-WARBLER.

Psilopus fuscus, Gould, Proc. Zool. Soc., 1837, p. 147.

Gerygone fusca, Gould, Bds. Austr., fol., Vol. II., pl. 98 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 267 (1865).

Pseudogerygone fusca, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 223 (1879).

ADULT MALE—General colour above brown washed with light amber; upper wing-coverts and quills brown externally margined with olive; tail ashy-brown slightly tinged with olive, and crossed with an indistinct blackish-brown band, all but the two central feathers having a large spot of white near the tip of the inner web, this spot increasing in size towards the outermost feather on either side, which is subterminally barred with white; lores, a narrow line over the eye, and the lower portion of the eyelid ashy-white; a spot in front of the eye blackish-brown; sides of the face, throat, and neck ashy-grey; remainder of the under surface greyish-white, passing into a purer white on the centre of the abdomen; the flanks, sides of the abdomen, and under tail-coverts strongly washed with buff; bill black; legs and feet greyish-brown; iris brownish-red. Total length in the flesh 4.1 inches, wing 2.1, tail 1.8, bill 0.32, tarsus 0.55.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Queensland, New South Wales.

THE type of *Gerygone fusca* was described by Gould in the Proceedings of the Zoological Society, in 1837, from a specimen in the collection of the Earl of Derby, its habitat being recorded as Australia. In his diagnosis there given, also in his descriptions of this species in his folio edition of the "Birds of Australia," and which is copied in his "Handbook," he states that the "two central tail feathers are brown, the remainder white at the base." This is at variance with his figures, and with the above description which is that of the bird found in the coastal brushes of Northern New South Wales, where Gould states *Gerygone fusca* inhabits.

An adult male, obtained by Mr. George Masters at Wide Bay, Queensland, in October, 1867, has not the light amber wash so pronounced as specimens procured on the Bellinger River, New South Wales, and the under surface is dull white with only a slight tinge of buff on the flanks and under tail-coverts.

An adult male and female procured by Messrs. Cairn and Grant, in 1889, at Boar Pocket on the table-land of the Bellenden Ker Range, North-eastern Queensland, which I have now before me, were erroneously recorded as *Gerygone culicivora*. In the character of their markings they are more nearly allied to the present species, but vary in other respects. They may be described as follows:—*Adult Male*: General colour above earth-brown, with a faint amber shade; upper wing-coverts like the back; quills dusky brown, externally margined with dull olive-brown; tail greyish-brown, tinged with olive and crossed with a broad-subterminal blackish-brown band, and having a large spot of white near the tip of the inner web of all but the two central feathers, this spot increasing in size towards the outermost feather on either side, which is subterminally barred with white; lores and a narrow line of feathers extending over the eye white; in front of the eye a spot of blackish-brown; ear-coverts earth-brown, slightly washed with light amber; chin and feathers below the eye white; remainder of the under surface and under tail-coverts white, tinged with faint brownish-buff. Total length 3.5 inches, wing 1.95, tail 1.7, bill 0.33, tarsus 0.7. *Adult Female*: Similar in plumage to the male, but of a slightly purer white on the under surface.

* Rec. Aust. Mus., Vol. i., p. 30 (1890).

From Gould's figure and typical examples of *Gerygone fusca* obtained in New South Wales, these birds may be distinguished by the earth-brown hue of the upper parts, the lighter under surface, which is devoid of the greyish wash on the throat and sides of the head, and of the rich buff wash on the flanks, abdomen, and under tail-coverts; the spot in front of the eye is darker, and the lores and line over the eye a purer white. Whether these birds from Boar Pocket, which I propose to distinguish under the name of *Gerygone pallida*, will prove to be only a northern race of *G. fusca*, or a distinct species, I am unable to determine until I have had an opportunity of examining a series of specimens from different localities, intermediate between Wide Bay and Rockingham Bay.

Gerygone fusca is a resident species in the northern coastal rivers districts of New South Wales, its range extending as far south as the neighbourhood of Sydney. In the palm brushes about Tuggerah Lake, Ourimbah, and Gosford, it is common; and it is also found in the humid mountain gullies on the highlands of the Milson's Point railway line. I noted it at Roseville in October, 1902, and once procured a specimen in a scrub-lined creek intersecting open forest lands at Blacktown. Mr. George Masters informs me that in 1875 it was common in the late Sir William Macleay's garden at Elizabeth Bay, Sydney. Although a similar vegetation flourishes in the Illawarra District as about Ourimbah and Gosford, and many brush-frequenting species are common to the two districts, I have never observed it there nor have I seen it represented in any of the numerous collections made in that part of the State. It is strictly an inhabitant of the coastal districts and contiguous mountain ranges, and is not found in the dry inland portions of New South Wales. In habits it resembles very much the *Acanthiza*, hopping about among the leafy sprays or trailing vines in search of minute insects, which constitute its sole food.

Unlike *Gerygone albigularis*, it is possessed of but feeble powers of song, although if it is once heard it can easily be distinguished from that of any other species, even at some distance away. Its half sibilant, half whistling spring notes resemble the sounds of the words "What is it? what is it?" repeated several times. At the end of summer and in the autumn these notes are seldom uttered.

The nest is a dome-shaped structure, with a narrow bottle-neck like entrance, and has usually several inches of superfluous nesting-material below the domed portion. Outwardly it is formed of green mosses, with a slight admixture of spiders' web, the inner walls consisting entirely of very fine and soft bark fibre, which is again warmly and thickly lined at the bottom with soft silky plant-down, and sometimes with fur or feathers. Externally it is beautifully ornamented with pieces of pale greenish-grey lichens. In some nests the inner walls have long fine black hair-like rootlets, and skeletons of small leaves worked into them. The domed portion only has an inner lining; above and below it the structure is formed almost entirely of moss. An average nest measures nine inches in total length, of which the domed portion or nest proper measures four inches in height by two inches and a half in diameter; and the upper side of the neck-like entrance one inch and a quarter by five-eighths of an inch across the aperture. The nests, however, vary much in size, according to the length of the tail-like appendage beneath it. In seven nests found by me at Ourimbah, in November, 1901, the length of superfluous nesting material varied from two inches and a quarter to five inches, and the upper side of the spout-like entrance from three-quarters of an inch to three inches. Occasionally nests may be found with the domed portion neatly rounded off at the bottom. Little or no preference seems to be shown in the choice of a tree or vine as a nesting-site. In the scrubs of the northern coastal rivers it is often suspended to a Lawyer-vine (*Calamus australis*). About Ourimbah and Gosford I found them attached to a thin leafy spray of a Lilli-pilly (*Eugenia smithii*), Maiden's Blush (*Sloanea australis*), Sassafras (*Doryphora sassafras*), Coachwood (*Crystapetalum apetalum*), or to a prickly vine or Bramble (*Rubus moorei*), or a

"Sarsaparilla" (*Smilax australis*). I have also found them attached to dead gum saplings, and one overhanging a creek on a dead bare twig without any shelter whatever. Usually they are built from ten to fifteen or twenty feet from the ground, but I have seen them as low as three feet and as high as forty feet. Trees growing on the sides of or near creeks are favourite situations, but they may be also found in trees on the roadside or in the high brush far removed from water.

The eggs are two or three in number for a sitting, oval or elongate-oval in form, the shell being close-grained, smooth, and almost lustreless. They are of a white or reddish-white ground colour, which is finely freckled, spotted, and blotched with different shades varying

from dull to bright red, and faint purplish-red; the markings, whether large or small, are all irregularly shaped, and predominate as a rule on the thicker end, where a more or less well defined zone is frequently formed. Some specimens have but a few isolated spots and dots distributed over the shell, and in a set I took at Ourimbah, one of the eggs was pure white, while the remainder were thickly freckled, spotted, and blotched with bright red. A set of three, taken on the 24th November, 1901, measures as follows:—Length (A) 0.67×0.47 inches; (B) 0.65×0.46 inches; (C) 0.66×0.47 inches. A set of two taken on the following day from the nest figured, measures:—(A) 0.6×0.47 inches; (B) 0.62×0.47 inches.

So far as I have observed, the female alone undertakes the task of nest-building, the male being usually in a tree near by, and enlivening her with his song. I have had many opportunities of watching the nests of this species being built, from the commencement to the finish. They are formed precisely in a similar manner to those of *Gerygone albigularis*, a pendant mass of nesting material first being collected, an entrance afterwards



NEST OF BROWN BUSH-WARBLER.

being made into it and the domed portion, formed by forcing out the sides and lining it with bark fibre and plant down.

The nest figured, which gives a side view of the structure, was built within three feet of the ground, in a mass of vines overgrowing a small bush at Ourimbah. It was commenced on the morning of the 10th November, 1901; at that time only a small quantity of moss and a little cobweb was built around a horizontal vine stem. Two days later, it was a long rounded mass of similar nesting material, measuring ten inches in length. The following day

an entrance was made, and a spout-like tunnel formed, the latter being unusually long and well developed. The bird would frequently carry material to the structure and work while I was only a yard away from it. A peculiar habit this species has when building is to rapidly gyrate down the structure, from the top to the bottom, fastening in the material in its descent. The domed portion of the nest was then formed, filled out, and completed on the 22nd inst., or twelve days from its commencement. An egg was deposited on the 23rd November, and another on the 25th inst. Externally it measures nine inches in total length, and from the front of the entrance across the domed portion of the structure four inches and a quarter. The superfluous nesting material beneath, which consists only of mosses and lichens and is thicker and more rounded than usual, measures three inches.

Another nest which I saw commenced, and frequently watched during building operations, I was surprised to find on the ground fifteen days after it was begun, and the birds hopping about the tree it had been in. On opening the structure, I found two recently broken and slightly incubated eggs of *Gerygone fusca*, and one fresh and perfect egg of the Bronze Cuckoo (*Lamprolaima placens*). I concluded the weight of the latter bird had torn the nest asunder, but how it managed to deposit its egg in it is a mystery to me, for the aperture of the narrow spout-like entrance of the nest was barely three quarters of an inch in width.

The breeding season, which commences in September, continues until the end of January.

Gerygone culicivora.

WHITE-TAILED BUSH-WARBLER.

Psilopus culicivorus, Gould, Proc. Zool. Soc., 1840, p. 174.

Gerygone culicivora, Gould, Bds. Austr., fol., Vol. II., pl. 99 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 268 (1865).

Pseudogerygone culicivora, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 220 (1879).

ADULT MALE—General colour above ashy-brown, slightly washed with olive, the latter colour being more distinct on the rump and upper tail-coverts; lesser wing coverts like the back, the median and greater coverts brown, with indistinct paler margins; quills brown, externally edged with ashy-white, the basal portion of the outer webs of the secondaries washed with olive; two central tail-feathers ashy-brown, narrowly edged with white near the centre and having a blackish-brown wash towards the tips, the remainder white on the basal half, blackish-brown on the apical portion, with a spot of white at the tip of the inner web, this spot increasing in size towards the outermost feather which is subterminally barred with white; extreme bases of the central feathers dark brown; lores and a narrow line over the eye ashy-white; a spot in front of the eye blackish-brown; chin, fore-neck, and breast ashy-white; centre of the abdomen and under tail-coverts pure white; bill black; legs and feet black; "iris light reddish-yellow" (Gould). Total length 4 inches, wing 2.3, tail 1.8, bill 0.32, tarsus 0.75.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Western Australia, South Australia, Victoria, New South Wales, Queensland, Central Australia.

THE range of the White-Tailed Bush-Warbler extends over the greater portion of Southern Australia, but it is more common in the western than the eastern parts of the continent. Mr. George Masters, collecting on behalf of the Trustees of the Australian Museum, obtained specimens at Port Lincoln, South Australia, and again, three years after, at King George's Sound, in December, 1868. An example was also obtained by Messrs. Cairn and Grant while collecting near Bourke, on the Darling River, New South Wales, in November, 1888; and Mr. E. H. Lane has for two successive years, 1899 and 1900, taken its nest and eggs on Wambangalang Station, near Dubbo, in the former instance also shooting one of the

birds which he sent me for identification. Through Mr. G. A. Kearland I have also received its nest and eggs, taken by Mr. C. E. Cowle, near Illamurta, Central Australia.

Mr. C. W. De Vis, M.A., has kindly forwarded me two specimens of *Gerygone culicivora* for examination from Queensland. One obtained by Mr. K. Broadbent at Chinchilla, on the banks of the Condamine River, in May, 1885, and referred to by him as *Gerygone fusca* has the upper parts paler and strongly tinged with olive, and the outer webs of the quills are distinctly washed with yellowish-olive. Judging by the tail feathers, it is evidently in the moult. Another specimen, procured by Mr. Broadbent in October, 1885, at Charleville, on the Warrego River, about five hundred and twenty miles west of Brisbane, and recorded as *Gerygone mastersi*,[†] is precisely similar to a specimen of *G. culicivora*, obtained by Mr. Masters at Port Lincoln, South Australia, in December, 1865.

It is evident that the present species is subject to individual variation, for none of our specimens from any part of Australia show any trace of the "ochraceous-buff wash on the sides of the body," as characterised by Dr. Sharpe in his description of *Gerygone culicivora*.[‡]

A nest of this species, taken by Mr. E. H. Lane on the 28th October, 1900, at Wambangalang Station, resembles a small nest of *G. albigularis*. It is pear-shaped in form, with an entrance near the top, slightly sheltered with a small hood, and has the common tail-like appendage, which is shorter than usual, at the bottom of the structure. Outwardly it is formed of very fine strips of bark, dried grasses, spiders' cocoons, and small fragments of newspaper, all matted up together, and coated with a lacework of spiders' webs; inside, the bottom portion of the nest only is lined with very fine dried grasses and a few feathers. Externally it measures six inches and a quarter in height over all by two inches and a half in diameter, and across the entrance nine-tenths of an inch. It was attached to the thin leafy twigs of a stringy-bark sapling, about fifteen feet from the ground, and was a mile and a half away from the nearest water.

Eggs three in number for a sitting, oval in form, the shell being close-grained, smooth, and almost lustreless. Of a set of three taken by Mr. Lane on the 4th November, 1899, two of them are of a very pale fleshy-white ground colour, which is minutely and finely freckled with dull pinkish-red, the markings predominating on the thicker end where a well defined zone is formed; the other specimen is white, faintly tinged with yellowish-buff, with a zone of dull red spots on the larger end, the remainder of the shell being devoid of markings. They measure as follows:—Length (A) 0.63×0.48 inches; (B) 0.64×0.47 inches; (C) 0.64×0.47 inches.

In New South Wales, October and the three following months, apparently constitute the breeding season of this species.

Gerygone magnirostris.

LARGE-BILLED BUSH-WARBLER.

Gerygone magnirostris, Gould, Proc. Zool. Soc., 1842, p. 133; *id.*, Bds. Austr., fol., Vol. II., pl. 100 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 270 (1865); North, Ibis, 1893, p. 373.

Pseudogerygone magnirostris, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 222 (1879).

ADULT MALE—General colour above brown, slightly tinged with olive: upper wing-coverts like the back; quills brown, externally edged with olive-brown; tail feathers brown, crossed by an indistinct subterminal blackish-brown band, all but the two central ones having a dull whitish spot near the tip of the inner web; a spot in front of the eye dusky brown, a smaller one near the nostril, and the eyelid above and below, white; sides of the neck fulvous-brown; throat and all the

* Proc. Roy. Soc. Queensld., Vol. ii., p. 121 (1886).

† Proc. Roy. Soc. Queensld., Vol. iii., p. 28 (1887).

‡ Cat. Bds. Brit. Mus., Vol. iv., p. 220 (1879).

under surface white, tinged with fulvous-brown on the breast and flanks: under tail-coverts white; bill deep olive black: legs and feet black: "iris red" (Broadbent). Total length 3·8 inches, wing 2·1, tail 1·7, bill 0·4, tarsus 0·7.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Northern Territory of South Australia, North-eastern Queensland.

THIS species was discovered by Gilbert on Greenhill Island, near Port Essington. Apparently it is rare in that portion of the continent, for it was not represented in either of the large collections made by Mr. Alex. Morton and the late Mr. E. Spalding at Port Essington and Port Darwin. Mr. Charles French, Junr., has, however, sent me a mutilated skin of a bird that was obtained, together with its nest and egg, near the Daly River, in the Northern Territory of South Australia, in January, 1903. Dr. Sharpe has recorded it from Thursday Island, and I have received specimens for examination from the Trustees of the South Australian Museum, Adelaide, that were procured at Cape York. Although the wing-measurements of specimens obtained in these widely separated localities are alike, the bill of the example from the Northern Territory of South Australia is slightly larger than those of specimens procured at Cape York, while the bills of the latter are larger than those of examples obtained farther south at Cardwell and the Herbert River. There is also a slight variation in the marking at the tip of the inner web of the tail-feathers, some being only narrowly edged with white, others having a more or less distinct white spot. Gould, in his description, makes no mention of the small white spot at the nostril, or that the eyelid above and below is white. The lower figure of this species, also in his folio edition of the "Birds of Australia," is represented as having whitish tips to all the tail-feathers. Mr. George Masters, in describing *Gerygone simplex*,¹ from the Gulf of Carpentaria, compares it with the present species, *G. magnirostris*. I find, however, on examining the type at the Macleay Museum, and several other specimens procured at the same time by Mr. Broadbent, that it corresponds almost precisely with Dr. Sharpe's description of *G. levigaster*. From Gould's original description and figure of the latter species, the bird described by Mr. Masters differs chiefly in not having the entire tips of all but the two central tail-feathers white, and in the absence of the pronounced white orbital ring, as represented in Gould's lower figure. Notwithstanding these discrepancies, I agree with Dr. Sharpe in regarding *Gerygone simplex* as the same as *G. levigaster*, Gould.

Mr. Frank Hislop informs me that *Gerygone magnirostris* is common in the Cooktown and Bloomfield River Districts, where it is known as the "Flood-bird," from its usual habit of building on a creeper or vine overhanging water, and its nest resembling a mass of *débris* left by the water after the creeks or rivers have been unusually high or flooded, although occasionally their nests are found in the forest, far away from water.

There are specimens in the Australian Museum collection, obtained by Mr. Kendal Broadbent, near Cardwell, and I received a female, together with its nest and eggs, from Mr. J. A. Boyd while resident at the Herbert River, who informed me that it is a common species in that neighbourhood.

With but few exceptions, all the nests of this species found by Mr. Boyd were built in low trees overhanging a river or the bed of a creek. Early on the morning of the 25th of November, 1892, Mr. Boyd was successful in capturing a female sitting on her two eggs, and also on one of a Bronze Cuckoo. The nest was built in a Shaddock-tree in the garden, this being the first occasion on which he had ever found the nest not overhanging a bank or stream. Subsequently Mr. Boyd obtained a nest with two fresh eggs on the 9th of December, and another on the 17th with three fresh eggs in it.

* Rep. Voy. H.M.S. "Alert," p. 13 (1883).

† Proc. Linn. Soc. N.S.W., Vol. i., p. 52 (1876).

‡ Cat. Bds. Brit. Mus., Vol. iv., p. 224 (1879).

EXPLANATION OF PLATE A 2

Nest and eggs of *EMPHIDROMYAS ROSEA*.
Rose-breasted Robin.

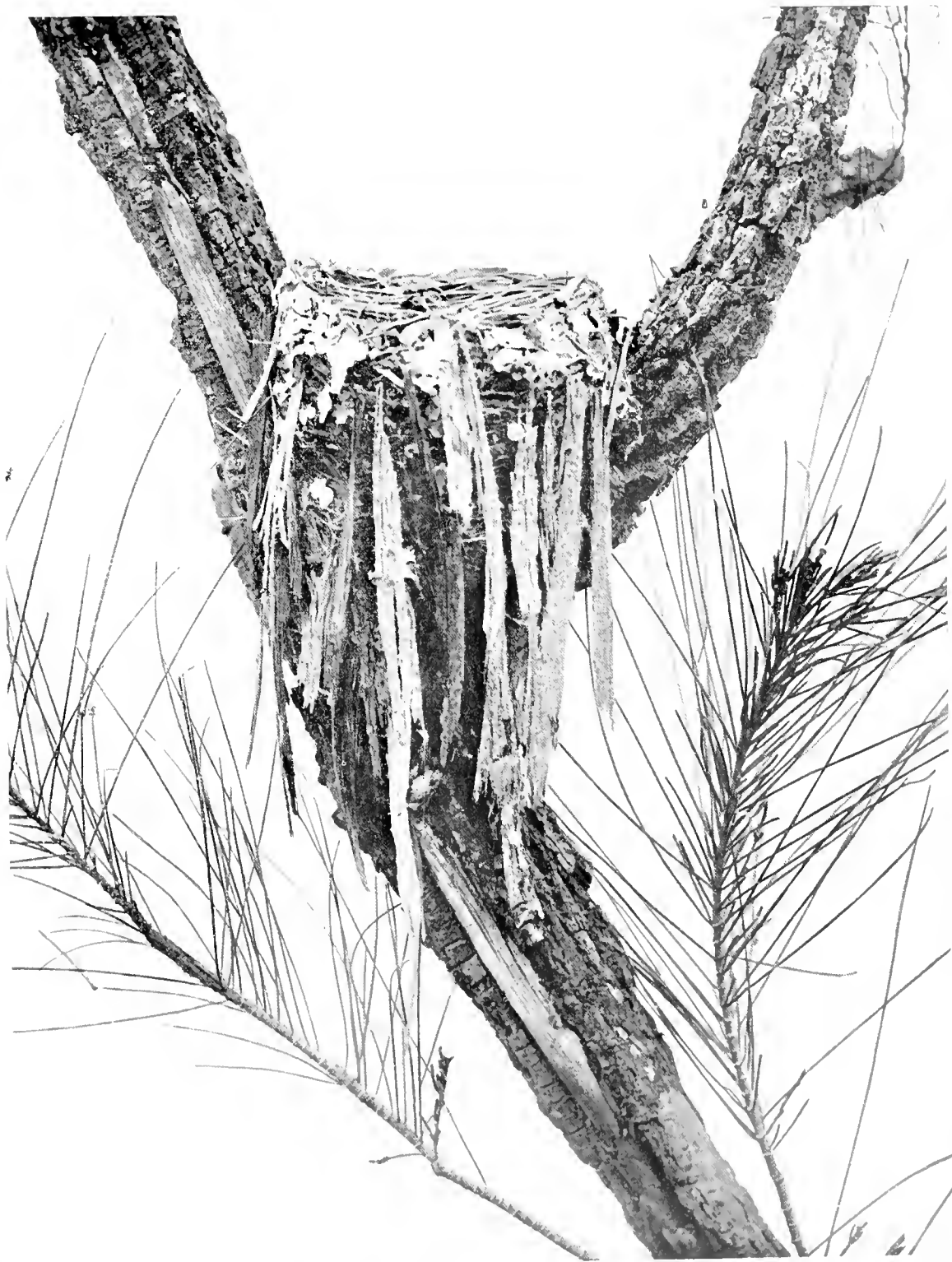


EXPLANATION OF PLATE A. 3.



Nest of *Eopsaltria australis*.

Yellow-breasted Robin.



EXPLANATION OF PLATE A 4.

Nest of *GERYGONE ALBIGULARIS*.
White-throated Bush-Warbler.



From Mr. Boyd I have obtained several nests and sets of eggs for description, also the female that was captured on the nest. The nests of *Gerygone magnirostris* are long pendant structures varying from sixteen to twenty-four inches in length, the drooping end of a nearly leafless twig being covered with an irregular layer of nest-material, about two inches and a half in diameter, and from nine to twelve inches in length before the nest proper is commenced. This is of a domed form, with a protecting hood well concealing the narrow entrance, and terminating at the lower extremity of the dome in a beard or tail, which is typical of the nests of this genus. They are composed of shreds of bark, cocoa-nut fibre, dried grasses and weeds, skeletons of leaves, and the silky covering of spiders' nests, all matted together, and resembling more a hanging mass of *debris* left by floods than a nest. The interior cavities of the nests are small and are warmly lined with feathers. An average one measures as follows:—total length twenty-two inches; from the top of the covered portion of the stem on which it is built to the swelling of the dome ten inches; domed portion or nest proper: length seven inches, breadth five inches; beard or tail underneath dome five inches; entrance to nest one inch in diameter; interior cavity: height three inches and a quarter, breadth two inches and a quarter; base of interior portion of protecting hood over entrance two inches. The eggs are two or three in number for a sitting, and vary in shape from oval to elongate-oval, the shell being close-grained and its surface smooth and lustreless. Typically they are of a rich pinkish-white ground colour, which is almost obscured by exceedingly minute freckles and dots of pinkish-red, becoming thicker towards the larger end, where, in some instances intermingled with a few spots of dull purplish-grey, an indistinct zone is formed. Others have the markings larger and of a darker shade of red, equally distributed over the shell, with one or two fine hair-lines or small coalesced patches on the larger end. The set of two, on which the female was captured, measure alike 0.7×0.46 inches. A set of three, taken on the 1st of January, 1892, measures:—Length (A) 0.69×0.5 inches; (B) 0.67×0.47 inches; (C) 0.67×0.49 inches. A set of two, taken on the 10th October, 1892, measures:—(A) 0.65×0.48 inches; (B) 0.65×0.47 inches.

Since my descriptions of the nest and eggs of *Gerygone magnirostris* were published in "The Ibis," in 1893, Mr. Boyd has kindly supplemented his information relative to the finding of other nests of this species. His record for a normal breeding season is finding a nest with one fresh egg on the 1st September, 1893, and, on the 6th January, 1894, procuring two nests, each with two eggs, one of them also containing a bronze coloured egg of a Cuckoo. Between these two dates Mr. Boyd found many nests containing eggs and young. On the 17th April, 1896, he wrote as follows:—"On the 6th instant I found a nest of *Gerygone magnirostris*, built on a vine tendril near the verandah of my brother's house, containing three eggs. This position is further removed from water than I have found one before, and the nest was comparatively slightly built, doubtless owing to the absence of drift material with which the lower branches of the trees on the creek banks are covered." On the 21st October following, Mr. Boyd saw presumably the same pair of birds constructing their nest on the same vine.

This species is often the foster-parent of one of the Bronze Cuckoos, the eggs of which are of a deep olivaceous-brown, minutely marked with small black dots on the larger end, and not unlike the eggs of *Lamprococcyx flagosus*, but larger, darker, and the surface of the shell smooth and glossy. Three Cuckoo's eggs, taken from different nests of *Gerygone magnirostris*, measure as follows:—(A) 0.83×0.55 inches; (B) 0.78×0.53 inches; (C) 0.8×0.53 inches. The average measurement of six eggs of *Lamprococcyx flagosus*, taken from nests in the neighbourhood of Sydney, is 0.72 inches in length by 0.51 inches in breadth.

* "The Ibis," 1893, p. 373.

Gerygone personata.

MASKED SCRUB-WARBLER.

Gerygone personata, Gould, Proc. Zool. Soc., 1866, p. 217; *id.*, Bds. Austr., fol., Suppl. pl. 14 (1869).

Pseudogerygone personata, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 229 (1879).

ADULT MALE—*General colour above olive-green; lesser and median wing-coverts like the back; greater wing-coverts and quills dark brown, narrowly edged externally with yellow; tail feathers brown, washed with olive; forehead and feathers in front of the eye brown; lores and a stripe extending from the base of the lower mandible to below the ear-coverts white; throat dark brown; remainder of the under surface and under tail-coverts pale yellow; bill black; legs and feet blackish-brown. Total length $\frac{1}{2}$ inches, wing 2.2, tail 1.7, bill $0\frac{1}{4}$, tarsus $0\frac{1}{2}$.*

ADULT FEMALE—*Differs from the male in the absence of the brown forehead and throat; chin whitish; throat yellow like the remainder of the under surface.*

Distribution. North-eastern Queensland.

THE Masked Scrub-Warbler inhabits the coastal brushes of North-eastern Queensland, from Cape York as far south as the Herbert River District. During the "Chevert" Expedition, Mr. George Masters obtained three adult males, three adult females, and one young male at Cape York, also an adult male on the Endeavour River, near Cooktown, and a female on Palm Island.

Dr. Sharpe, in the "Catalogue of Birds in the British Museum," regards *Gerygone flavida*, Ramsay, as the female of *G. personata*, and places it as a synonym of the latter species, an opinion also held by Mr. Masters, who informs me that he always observed the male of *G. personata* in company with a yellow-throated bird. I have compared the type of *G. flavida* with the females of *G. personata* in the Macleay Museum, and cannot find any difference between them. The curious habit of these birds, from Cape York to the Herbert River, of forming a nest generally of palm fibre, and placing it at the end of a drooping branch or a vine in close proximity to a hornets' nest, tends to prove they are all referable to one species. It is remarkable, however, that six adult specimens, labelled *G. flavida*, in the Australian Museum, obtained by Mr. Kendal Broadbent at various times near Cardwell and the Upper Herbert River, are destitute of the dark forehead and throat, as occurs in the adult male of *G. personata*. Neither have I seen in any collection a typical example of a fully adult male of this species that was obtained from further south than the scrubs of the Endeavour River. Dr. Ramsay took his description of *G. flavida* from two birds obtained by Mr. Broadbent in the Herbert River District, that are alike in plumage, and which the collector had labelled "scrub-bird," "new," and respectively male and female. Apparently it is common in the Herbert River District, for Mr. E. H. Webb informs me that in 1902 he found two nests, each containing two eggs, and five old nests all of which were built in lawyer-vines in thick scrub and close to hornets' nests. These nests he referred to those of *G. personata*, but, as in Mr. Frank Hislop's experience in the Bloomfield River District, he only caught a passing glimpse of the bird as he flushed it from the nest, and never handled a specimen. While at the Australian Museum, Mr. Webb however readily recognised a nest of *G. personata*, obtained by Mr. B. Jardine at Cape York, as being the same as those he had found on the Herbert River. Mr. C. W. De Vis, M.A., who regards *G. flavida* as a distinct species, has recorded it from the foot of Mount Bellender Ker.†

* Cat. Bds. Brit. Mus., Vol. iv., p. 230 (1879).

† Rep. Sci. Exped. Bell. Ker, p. 86 (1889).

Mr. Bertie L. Jardine writes me as follows:—" *Gerygone personata* is by no means uncommon around Cape York, where it frequents the most solitary and gloomy portions of our dense scrubs. Consequently, with the exception of a passing glimpse now and then, it is seldom seen and its habits are difficult to thoroughly study. In its restlessness and general movements it much resembles *Machærorhynchus flaviventer*. It lives almost exclusively on small insects, many of which are taken on the wing; but as the intertwining of vines and branches often offer serious obstacles to the rapid wing movements required in flight, their food is principally procured from under leaves, bark, etc.

"The breeding season commences in November, and continues through the four following months. The nest is of an elongated dome shape, having the entrance near the top, which is protected by a projecting hood, and is usually suspended from a pendant supple branch. Strange to say, in almost every instance in which I have found them, they have been built close to a hornets' nest. The nest is built of soft bark-fibre and grasses, and usually contains two eggs."

Mr. Frank Hislop informs me that there is a species of *Gerygone* in the scrubs of the Bloomfield River, that generally builds on the end of a twig or a lawyer-leaf near a wasp's nest, but owing to the proximity of the latter he has never been able to obtain a specimen or satisfactorily determine to which species the nest belongs. The eggs are usually two in number and frequently a bronze-coloured egg of a Cuckoo is found in the nest. Doubtless it is referable to the present species.

A nest taken by Mr. Jardine at Somerset, Cape York, on the 11th January, 1900, is attached to a thin thorny stem of a vine. In form it resembles the nest of *Gerygone fusca* being a dome-shaped structure with a long bottle-neck like entrance, and having a small quantity of superfluous nesting material below the domed portion of the structure. It is constructed throughout of very fine yellow palm fibre, with an admixture of spiders' webs near the top and on the spout-like entrance. There is a slight lining of soft downy silky-white seeds, but with the exception of some wood-borings that have been collected from the covering of an orifice in a limb, made by the larvæ of a moth, it is without any outside decoration. It measures externally nine inches in total length, and in width (including the entrance) four inches and a half; across the domed portion of the nest two inches and a half, and along the upper side of the spout-like entrance three inches. Another nest, taken at Cape York, is much shorter, having no tail-like appendage below the nest, and is formed externally of very fine strips of bark, woven together with spiders' webs, ornamented with the white and green egg-bags of spiders, and lined inside with silky-white seeds. Externally it measures six inches in length by three inches in diameter at its widest part.

The eggs are two in number for a sitting; they are oval in form, the shell being close-grained, smooth, and slightly lustrous. A set of two, taken by Mr. Jardine on the 11th January, 1900, are of a faint reddish-white ground colour, which is minutely freckled all over with dull purplish-red; the markings, although small and nearly invisible except on the larger end, are so thickly disposed that the ground colour is almost obscured. Length (A) 0.67×0.5 inches; (B) 0.68×0.51 inches. Another set of two, taken at Cape York, are pure white freckled with dull red, which is more thickly disposed towards the larger end, where an ill-defined zone is formed. Length:—(A) 0.69×0.48 inches; (B) 0.68×0.48 inches.

Genus MALURUS, Vieillot.

Malurus cyaneus.

LONG-TAILED SUPERB-WARBLER

Motacilla cya. Ellis, Narr. Voy. Capt. Cook, Vol. I., p. 22 (1782); Anderson in Cook's Voy.

Pacif. Ocean, Vol. I., p. 109 (1785); Gmel., Syst. Nat., Tom. I., p. 991 (1788).

Superb Warbler, Lath., Gen. Syn., Vol. II., pt. 2, p. 501, pl. 53 (1783).

Malurus longicaudus, Gould, Proc. Zool. Soc., 1837, p. 148; *id.*, Bds. Austr., fol., Vol. III., pl. 19 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 320 (1865).

Malurus gouldi, Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 287 (1879).

Malurus cyaneus, North, Proc. Linn. Soc. N.S.W., Vol. XXVI., p. 632 (1901).

ADULT MALE.—Forehead, crown of the head, feathers below the eye, ear-coverts, and mantle, deep metallic blue; lores, feathers above the eye, sides of crown, hind-neck, back, rump, and upper tail-coverts celestly black; upper wing-coverts and quills brown; tail-feathers dark blue; cheeks, throat, and fore neck blue-black; a broad line of feathers on the upper portion of the breast celestly-black; remainder of the under surface dull white, tinged with fulvous-brown; the feathers adjoining the black line on the upper portion of the breast strongly washed with blue; under tail-coverts dull white, tinged with fulvous-brown; bill black; legs and feet dark brown; iris blackish brown. Total length in the flesh 5.5 inches, wing 2.15, tail 2.6, bill 0.4, tarsus 0.95.

ADULT FEMALE.—General colour above rufescent-brown; tail rufescent-brown, with a faint bluish shade on the inner webs of all but the two central feathers; upper wing-coverts like the back; quills dark brown, externally edged with rufescent-brown; lores, orbital ring, and feathers behind the upper portion of the eye rufous; all the under surface dull white, tinged with fulvous-brown; sides of the body and under tail-coverts fulvous-brown; bill reddish-brown; legs fleshy-brown, the feet slightly darker; iris blackish brown. Total length in the flesh 5.4 inches, wing 2.1, tail 2.6, bill 0.4, tarsus 0.92.

Distribution.—Tasmania, and some of the larger islands in Bass Strait.

THE Long-tailed Warbler, or Blue Wren, was the first described species of the genus *Malurus*, of which the adult males of all its members are noted for their brilliant or strikingly contrasted plumage. The present species was named by Ellis, who was Assistant Surgeon to Captain Cook's last expedition. On referring to Ellis's work, it will be found that the bird named by him as *Motacilla cyanea*, was met with in January, 1777, at Adventure Bay, Bruni Island, near the south-eastern coast of Tasmania. At that time Bass Strait had not been discovered, and the latter island was regarded as the southern extremity of Australia, and is so figured by Ellis in the accompanying chart. Latham, who figured and described this species in the year 1783, in his "General Synopsis of Birds," under the vernacular name of Superb Warbler, also refers it to the *Motacilla cyanea* of Ellis. The total length is there given as five inches and a half, and he states it inhabits Van Diemen's Land, the most southern part of New Holland. From Latham's description and figure Gmelin characterised it in 1788, in his "Systema Naturæ," under Ellis's name of *Motacilla cyanea*, and where the habitat is also recorded as Van Diemen's Land. The name of *Malurus cyaneus*, Ellis, will therefore have to stand for the Tasmanian species of Superb Warbler, and that of *Malurus superbus*, Shaw, for the well known species inhabiting South-eastern Australia.

It is remarkable that the habitat given in the works above quoted, should have escaped Gould's notice, when nearly half a century after the publication of Gmelin's description, he also described a similar bird under the name of *Malurus longicaudus*.

* Ellis—Narr. Voy. performed by Capt. Cook and Capt. Clarke in His Majesty's Ships "Resolution," and "Discovery," Vol. I., p. 22 (1782).

From *Malurus superbus* of Australia, to which species it is very closely allied, the male of the present species may be distinguished by the darker blue colour of the crown of the head, mantle, and ear-coverts, which is more apparent when the two species are placed together and held away from the light, and also by its average larger measurements.

It is represented in the Australian Museum collection by six specimens obtained by Mr. George Masters near the Ouse River and Maria Creek in 1867, and by other examples procured at Georgetown, Badger Head, and near Launceston. Several adult specimens of both sexes have also been recently received in the flesh from Mr. R. N. Atkinson, of Waratah, Mount Bischoff, Tasmania.

Of a number of adult males now before me from different parts of Tasmania, the wing measurement varies only from 2.05 to 2.15 inches, but the tails vary from 2.5 to 2.8 inches in length. They are alike in colour, but some have a bluish wash on the upper wing-coverts; in others the blue tips to the feathers on the upper breast extend lower down; and in one abnormally plumaged specimen the flank feathers and under tail-coverts are distinctly tipped with blue. As in *Malurus superbus*, some examples have the tail feathers narrowly edged with white at the tips. The upper and under tail-coverts of all species of the genus *Malurus* are very short, and in the males the former are more or less concealed by the lengthy velvety plumes of the lower portion of the back.

In his folio edition of the "Birds of Australia," Gould uses the vernacular name of Wren for all species of the genus *Malurus*, but in his Handbook he has referred to them under Latham's older name of Superb Warbler.

From Dr. L. Holden's MS. notes, the following information is extracted:—"I found a nest containing two eggs of the Blue Wren at Circular Head on the 14th October, 1886. It was built in the tangle at the foot of a tea-tree, and was a dome-shaped structure formed of dried grasses, lined inside with feathers. A month later I found another nest with three slightly incubated eggs. It was built in a clump of fern and coarse grass, two feet from the ground. This nest, which had the entrance large, and the dome covering incomplete, was thickly lined with hair, fur, and feathers. On the 18th November I took two eggs of *M. gouldi* and one of *Lamprococcyx basalis*, from a nest in a low bramble bush, which I had seen the female lining with feathers a few days before. On the 8th December, I found a nest containing four eggs in a pine, also one in a bramble bush with newly hatched young. On the 17th December, 1899, I found a nest with three eggs on the banks of the Styx River, built in a small *Hakea* shrub, about two feet from the ground."

Writing me from Waratah, Mount Bischoff, Mr. R. N. Atkinson remarks:—" *Malurus gouldi* frequents the low undergrowth in this district, and may be often seen in clear spaces in the forest hopping about the ground in search of insects. It possesses a very sweet and prolonged note. The nest is generally built about a foot or two from the ground, up to a height of eight feet, although I once found one resting on the ground, and supported by a few thin fallen twigs lying in some rank grass. In a pit on the 20th November, 1899, I found a nest of this bird, and thinking that it was old, pulled it to pieces. Returning a week later, I was surprised to find it all made up again and to contain three fresh eggs. Evidently the birds reconstructed it in a hurry as you will see by the lining materials being mixed up with the outer portion of the nest." In four nests now before me, taken by Mr. Atkinson, there is a great difference in their size and the materials of which they are outwardly constructed. The one previously referred to is nearly spherical in form, with a narrow entrance in the side, and is externally composed of very fine shreds of bark and grasses, mixed up with bright green mosses and a large quantity of cow-hair; internally it is lined with a thick layer of fur, Average external diameter four inches and three-quarters. Another, attached to the stems of a weed, is externally formed of dead mosses and fine grasses, intermingled with a large

quantity of the brown silky covering of freshly budded fern fronds, the inside also being lined with the latter material and a large quantity of the feathers of the Yellow-bellied Parrakeet. This nest was taken on the 17th December, 1899, and contained four fresh eggs. A third nest taken from a clump of rushes surrounded by water, is a long oval in shape with a narrow entrance near the top, slightly protected by a hood; it is rather loosely constructed of dried grasses, skeletons of leaves, and thin wiry rootlets, the inside being lined with very fine grasses and a layer of white cow-hair. It measures externally seven inches and a half in height by four inches in breadth; width of entrance one inch and a quarter. Another similarly shaped nest is outwardly constructed of very long strips of thin bark fibre, and dead weeds, and lined inside with a very thick layer of the feathers of the Yellow-bellied Parrakeet, and which evidently forms the chief lining to nests of all species in this locality where feathers are used.

The eggs are usually three or four in number for a sitting, oval or elongate-oval in form, the shell being close-grained, smooth, and lustreless. In ground colour they vary from pure white to fleshy and faint reddish-white, which is freckled, spotted, or blotched with different shades of red, the markings predominating as usual on the thicker end, where in some specimens they are confluent and form a more or less well defined cap or zone. Among a number of sets now before me, the prevailing hue of the markings is dull red and to a less extent purplish-red. Occasionally specimens are found distinctly spotted with dark red or reddish-black, and closely resembling the eggs of *Zephthanda albigula*, for which they might easily be mistaken. Of the latter type was a set of four, taken by Mr. E. D. Atkinson on the 15th October, 1892, from a nest built in a prickly acacia in his paddock at Table Cape, on the north-west coast of Tasmania. They measure:—Length (A) 0.72 × 0.52 inches; (B) 0.73 × 0.52 inches; (C) 0.75 × 0.54 inches; (D) 0.75 × 0.53 inches. A set of three, taken by Mr. R. N. Atkinson at Waratah, Mount Bischoff, on the 6th October, 1900, measures:—(A) 0.65 × 0.5 inches; (B) 0.7 × 0.51 inches; (C) 0.67 × 0.52 inches. Another set taken in the same locality on the 22nd November, 1900, measures:—(A) 0.7 × 0.54 inches; (B) 0.75 × 0.55 inches; (C) 0.73 × 0.56 inches.

Young males resemble the female, but the lores and feathers surrounding the eye are only washed with rufous, and the tail is dull blue. Semi-adult or young males in change of plumage have the distinguishing brown feathers of youth intermingled with the rich blue and black feathers of the adult, but the latter are less brilliant in colour. Almost the last trace of immaturity, with the exception perhaps of a brown feather here and there, is exhibited in the blackish shade to the feathers on the centre of the throat.

October and the three following months constitute the usual breeding season of this species, but while resident at Table Cape, on the north-west coast of Tasmania, Mr. E. D. Atkinson sent me a note that he had found a nest in a tea-tree, containing three fresh eggs, as late as the 22nd January, 1892.

Malurus superbus.

SUPERB WARBLER.

Sylvia cyanea (nec *Motacilla cyanea*, Ellis), Lath., Ind. Orn., p. 545 (1790), (*part*).

Motacilla superba, Shaw, in White's Journ. Voy. N.S.W., p. 256, and pl. opp. p. 256, upper fig., (1790).

Malurus cyaneus, Gould, Bds. Austr., fol. Vol. III., pl. 18 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 317 (1865).

Malurus superbus, North, Proc. Linn. Soc. N.S.W., Vol. XXVI., p. 632 (1902).

ADULT MALE—Forehead, crown of the head, feathers below the eye, ear-coverts, and mantle pale metallic-blue; lores, feathers above the eye, sides of crown, hind-neck, back, rump, and upper tail-coverts velvety-black; upper wing-coverts and quills brown; tail feathers dark blue; cheeks, throat,

and fore-neck blue-black; a line of feathers across the upper portion of the breast velvety-black; remainder of the under surface dull white, washed with fulvous-brown on the sides of the abdomen and lower flanks; the feathers adjoining the black line on the upper portion of the breast more or less washed with blue; under tail-coverts dull white tinged with fulvous-brown; bill black; legs and feet brown; iris black. Total length in the flesh 5 inches, wing 1.9, tail 2.25, bill 0.45, tarsus 0.9.

ADULT FEMALE.—General colour above brown, with a slight rufescent tinge which is more distinct on the rump and upper tail-coverts; upper wing-coverts brown; quills dark brown, externally edged with rufescent-brown; tail brown; lores, orbital ring, and feathers behind the upper portion of the eye chestnut-brown; all the under surface dull white, tinged with fulvous brown; sides of the body and under tail-coverts fulvous-brown.

Distribution.—Queensland, New South Wales, Victoria, South Australia.

THIS familiar and well known resident is an inhabitant of the south-eastern portion of the continent, and is more abundantly distributed near the coast than inland. The favourite haunts of this little bird are the scrubby sides of watercourses, the margins of tea-tree swamps, and low undergrowth over-run with climbing plants. It is also common about orchards and gardens, and even in the public parks of cities one's attention is frequently arrested by the rich blue and velvety-black attire of the adult male, as it pours forth its cheerful song from the top of some low bush or shrub. I have noted it in the Botanic Gardens at Sydney, Melbourne, and Adelaide, but it is far more common in the first locality, and still, as in Gould's time, rears its young in this beautiful resort. About Sydney it is known under the names of Superb Warbler, Blue Wren, and Cocktail.



SUPERB WARBLER.

Mr. George Caley, who lived at Parramatta and formed a collection of Australian birds from which Vigors and Horsfield took their descriptions, which were published in the "Transactions of the Linnean Society of London" in 1826, made the following observations on this species:—"They are gregarious, and polygamous to appearance, unless I have been deceived by the young birds possessing the plumage of the female. They are very good songsters, and I may say almost the only ones in the colony." The utterly fallacious and wide-spread belief, even at the present day, that the birds of Australia are not gifted with any powers of song, is

in a measure due to the latter misleading statement made by Caley in the early days of settlement in New South Wales. The notes of this species somewhat resembles the sounds produced by rubbing a cork quickly around the bottom of a tumbler.

The adult male of this species is exceedingly pugnacious when he sees his image reflected in a window or even in a piece of bright tin, and will remain pecking at it for some time. They also feign to be wounded, or simulate death very well. While collecting one day, an adult male that had been temporarily stunned soon recovered and tried to escape from its captor's hand. Failing in this respect, it closed its eyes and gradually let its head fall down as if dead, but when unobserved made efforts to get away. This it repeated several times, until my companion held it out in the open palm of his hand, when it quickly flew away.

The above descriptions are taken from specimens procured near Sydney. In over forty fully adult males now before me, obtained in New South Wales, there is no perceptible variation in the shade of the metallic-blue colour of the crown of the head, ear-coverts, and

mantle, but the latter varies in size, extending lower down the back in some specimens than others. The margins of the lesser and median wing-covers of some specimens are washed with blue, in others with black, and in both sexes specimens may be found with all but the two central feathers narrowly tipped with white. An adult male procured by Mr. Edwin Ashby, in May, 1886, at Ballarat, Victoria, has the wings dark brown, the upper wing-coverts being washed with greenish-blue, the quills externally with dull green. Examples from Port Lincoln, South Australia, have a slight silvery tinge to the blue of the crown of the head, ear-coverts, and mantle. The wing measurement of adult males varies from 1.85 to 2 inches.

For an opportunity of examining specimens obtained in the neighbourhood of Adelaide, I am indebted to the Director and Assistant Director of the South Australian Museum, also to Dr. A. M. Morgan and Mr. Edwin Ashby.

In writing of this genus Gould states that the gay attire of the male is only assumed during the pairing season, and is retained for a very short period, after which the sexes are alike in colouring, and referring to the present species remarks that in winter the adult males throw off their fine livery, and the plumage of the sexes then becomes so nearly alike that a minute examination is requisite to distinguish them.

In the Botanic Gardens and the suburbs of Sydney I have had these birds under almost daily observation for many years, and have noted fully plumaged males at all times and seasons. Having observed in the former place eight of these gorgeously plumaged birds within half-an-hour on the 21st June, 1894, I ceased to record seeing these birds in full livery in the depth of winter. In spring it is generally met with in pairs; but after the breeding season is over, accompanied by their young, they may be observed in small companies of from five to seven in number, consisting of a fully plumaged male and the remainder in the sombre plumage of the female, probably the last brood of the season. Other groups exhibit in addition to the brilliant attire of the fully adult male, and the modest garb of the female, young males in change of plumage and showing the tail alone blue or also an admixture of brown, blue, and velvety-black body feathers, according to their age. In winter these families congregate together, and it is possible for one to observe a score or more of these birds without seeing a fully adult male. During the last few years, while resident at Roseville, where these birds are common in the gardens and bush adjacent to my house, I have paid particular attention to individual pairs during the moulting season, and have daily noted many adult males in full plumage throughout January, February, March, and April, and from thenceforward throughout the year. Several examples of adult males in the moult now before me, shot on the 26th January, 1897, at Eastwood, near Sydney, have the old dull blue feathers on one side of the tail, and the half-grown new dark blue feathers on the other side. There is also a specimen in a similar stage of plumage obtained in the same locality on the 14th August; otherwise they are all in full and perfect plumage. Taking the former birds for an example, and leaving the body feathers out of the question, it would be necessary after the newly assumed tail feathers were fully grown, to again moult them for brown ones during the year, before they would be indistinguishable from the female. A young male in change of plumage, procured at Eastwood on the 17th September following, has a few of the dull blue tail feathers remaining, and the new dark blue tail feathers are not quite half grown. The old brown feathers of its youthful plumage on the body are nearly all moulted, and are replaced with the pale metallic-blue and velvety-black feathers of the semi-adult stage, several of the feathers on the head and all the new tail feathers being still enclosed in their sheaths at the base. The moulting season, especially of the quills and tail feathers, depends upon the age of the birds, for specimens may be found in the same stage of the moult, and in similar plumage, at opposite seasons of the year. So far as my experience goes with the different species I have observed, these remarks apply to all members of the genus.

Insects and their larvæ form the chief portion of the food of this species, but in winter I have seen them in the Botanic Gardens, Sydney, pecking at the fallen berries of the common introduced Olive (*Olea europæa*). Much of their food is obtained upon grass lands, over which they quickly progress in a series of hops, and with the tail carried over the back. These birds may be easily attracted close to one by imitating their note or producing a hissing sound with the teeth.

The nest is a dome shaped structure, with the upper portion slightly overhanging a narrow entrance in the side; it is formed externally of fine strips of bark-fibre, intermingled with dried grasses and matted together with a slight addition of cobweb, the inside being lined with finer dried grasses, and at the bottom a thick layer of feathers, hair, fur, wool, or other soft material. An average nest measures five inches in length by three inches in breadth, and across the entrance one inch. Usually it is built near the ground, stunted *Melaleuca* or *Hakea* shrubs being preferred. About gardens, thickly-leaved shrubs, prickly hedges, briar, and blackberry bushes, more especially with grass growing through them, are favourite nesting sites.

The eggs are three or four, rarely five, in number for a sitting, and are oval or elongate-oval in form, the shell being close-grained, smooth and lustreless. They vary from a fleshy-white to a light reddish-white ground colour, which is minutely dotted, spotted, or blotched with pale red or different shades of reddish-brown. Some specimens have the markings of a uniform size and evenly distributed over the surface of the shell; others have irregular shaped blotches sparingly intermingled with very minute dots, but in most of them the markings predominate on the larger end, where not infrequently a zone or cap is formed. A set of four, taken at Roseville, near Sydney, on the 3rd October, 1898, measures as follows:—Length (A) 0.67 × 0.5 inches; (B) 0.66 × 0.5 inches; (C) 0.68 × 0.49 inches; (D) 0.67 × 0.48 inches. A set of three, taken at Chatswood on the 19th December, 1898, measures:—Length (A) 0.7 × 0.48 inches; (B) 0.7 × 0.47 inches; (C) 0.69 × 0.48 inches. Each of these sets also contained an egg of the Rufous-tailed Bronze Cuckoo (*Lamprococcycv basalis*).

This species exhibits the same stages of plumage as does *Malurus cyaneus*, in its progress from youth to maturity. Young males resemble the adult females, but have the chestnut-brown orbital ring not so well defined; in slightly older birds it is entirely lost. The tail feathers are dull blue and the bill is nearly black in some specimens. On the 26th January, at Middle Head, I saw an adult full plumaged male and female, accompanied by their young brood; two of the latter resembling the adult female, another young male being distinguished by a black bill and lores, and a dull blue tail. On the 13th May, at Roseville, I saw another similar pair of adult birds, accompanied by their young in precisely the same stage of plumage. In their progress towards maturity young males are darker in plumage than the female; a triangular-shaped patch in front of the eye and bill is black, the tail-feathers dark blue, some of the feathers of the head and mantle tipped with metallic blue, and the upper wing-coverts washed with greenish-blue. Not quite adult males may be distinguished by their smaller mantle and the paler colour of the metallic blue feathers of the crown of the head, ear-coverts, and mantle which have a decided silvery tinge.

Nidification begins in New South Wales at the latter end of July, and the breeding season continues until the end of February. The task of incubation, in which the male shares, lasts about fourteen days. They are persistent breeders, and I know of an instance where a pair reared their brood at Chatswood after the female had been robbed of her eggs on four consecutive occasions.

The egg of the Rufous-tailed Bronze Cuckoo (*Lamprococcycv basalis*), is frequently laid in the nest of this species, and sometimes that of the common Bronze Cuckoo (*L. plagosus*). As I

have previously pointed out, if the eggs of the Cuckoos are deposited before the rightful owners have begun to lay, they are frequently covered by the Warblers with a layer of nesting material sufficiently thick to prevent incubation.

Malurus cyanochlamys, Sharpe,[†] of Queensland, is at the most only a slightly paler northern race of *M. superbus*. Dr. Sharpe, in describing the adult male which was obtained at Moreton Bay, points out that it is distinguished by the blue head, ear-coverts, and mantle being "much lighter, pale, and of a silvery-cobalt, instead of the deep cobalt-blue of *M. cyanus*; the mantle is also smaller and more circumscribed." These characteristics are also applicable to the not quite adult stage of the males of *M. superbus*. Mr. C. W. De Vis, M.A., has kindly forwarded me on loan three adult males from Queensland. They are slightly paler than typical examples of *M. superbus* obtained in New South Wales, as are also other specimens in the collection from the Dawson River District, but are indistinguishable from a not quite adult male obtained at Toongabbie, near Sydney, and another procured at Cambewarra, in the Illawarra District, New South Wales. The mantle of one of the adult males lent by Mr. De Vis is larger than is found in typical New South Wales examples. I cannot find any difference between adult females obtained in Queensland and New South Wales.

Malurus melanotus.

BLACK-BACKED SUPERB WARRLER.

Malurus melanotus, Gould, Proc. Zool. Soc., 1849, p. 163; *id.*, Bds. Austr., fol., Vol. III., pl. 20 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 322 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 288 (1879).

ADULT MALE—Forehead, crown of the head, mantle, and upper portion of the back rich cobalt-blue; lores, sides of crown, and neck, and a nuchal collar velvety-black; lower back and rump velvety-black; upper tail-coverts rich cobalt-blue; upper wing-coverts and quills brown, externally edged with greenish-blue; tail feathers dull blue with a greenish tinge which is more distinct on the basal portion, the central pair having narrow white tips which increases in extent towards the outermost feathers; feathers below the eye and the ear-coverts turquoise blue; throat and fore-neck cobalt-blue, followed by a narrow velvety-black crescentic band across the upper portion of the breast, which widens out at each side; remainder of the under surface and under tail-coverts cobalt-blue; bill black; legs and feet dark brown; iris black. Total length 4·8 inches, wing 1·92, tail 2·4, bill 0·32, tarsus 0·8.

ADULT FEMALE—Above brown; upper wing-coverts brown; quills brown narrowly edged externally with brownish-white; tail feathers brown, slightly washed with dull blue which is more distinct on the central pair; the lateral feathers tipped with dull white; an acute angled patch of feathers in front and a circle of feathers around the eye dark chestnut red; all the under surface pale fulvous brown, slightly darker on the sides of the neck, breast, and under tail-coverts.

Distribution.—Queensland, Western New South Wales, Victoria, South Australia.

THE habitat of the Black-backed Superb Warbler is restricted to the inland portions of the Australian continent. The type was obtained by one of Captain Sturt's party, in South Australia in 1839. Mr. James Ramsay procured adult males and females, together with their nests and eggs, at Tyndarie, New South Wales, in 1882. So likewise did the late Mr. K. H. Bennett, in the Mossiel District, in October and November, 1885 and 1886. Mr. R. Grant obtained specimens near Byrock in 1887. Its range extends throughout the north-

* Proc. Linn. Soc. N.S.W., 2nd ser., Vol. viii., p. 436 (1893).

† Proc. Zool. Soc., 1881, p. 788.

western portions of New South Wales, into Western Queensland, where Mr. K. Boardent obtained specimens at Charleville, on the Warrego River, five hundred and twenty miles west of Brisbane, and of which Mr. C. W. De Vis kindly forwarded me an adult male for examination. I also saw a set of the eggs of this species in the collection of Mr. Charles French, Junr., taken by him from a nest built in a brush-fence, in the Wimmera District, North-western Victoria, in October, 1898.

The mantle is larger and darker in very old males, and the greater wing-coverts and inner secondaries are more distinctly washed with blue. Some adult males have the cobalt-blue feathers of the lower breast slightly tinged with green; others, shot while nesting, have the centre of the abdomen dull brownish-white. The wing measurement varies from 1.85 to 2 inches.

The nest is a dome-shaped structure with a rounded entrance near the top. Those found by the late Mr. K. H. Bennett in the neighbourhood of Mossgiel and Ivanhoe, in the Western District of New South Wales, were formed on narrow strips of bark, and dead grasses, with which were intermingled a little wool, the inside being partially lined with a few feathers. It is generally placed in a low bush. An average nest measures five inches and a half in height by three inches and a half in diameter.

The eggs are three or four in number for a sitting; oval or thick oval in form, the shell being close-grained, smooth, and lustreless. They vary in ground colour from a pure white to a rich pinkish or faint reddish-white, which is finely freckled, dotted, or blotched with different shades, varying from pinkish-red to rich red. In some specimens the markings are sparingly but distinctly and evenly distributed over the surface; in others they partake the form of indistinct fleecy streaks, which gradually become darker on the thicker end, where they coalesce and form a distinct cap or zone. A set of three, taken by the late Mr. K. H. Bennett, at Mossgiel in November, 1886, measures as follows:—Length (A) 0.63×0.48 inches; (B) 0.64×0.45 inches; (C) 0.65×0.45 inches. A set of four, taken by Mr. C. French, Junr., in the Wimmera District, Victoria, in October, 1898, measures:—(A) 0.67×0.48 inches; (B) 0.67×0.41 inches; (C) 0.68×0.41 inches; (D) 0.64×0.47 inches.

Malurus callainus.

TURQUOISINE SUPERB WARBLER.

Malurus callainus, Gould, Proc. Zool. Soc., 1867, p. 302; *id.*, Bds. Austr., fol., Suppl., pl. 23 (1869); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 289 (1879).

ADULT MALE—*Forehead, crown of the head, mantle, and upper portion of the back, lustrous turquoise-blue; lores, sides of crown and neck, and a broad collar on the hind-neck velvety-black; lower back and rump velvety-black; upper tail-coverts turquoise-blue; wings brown, the quills washed externally with greenish-blue; the inner secondaries and the median and greater wing-coverts margined with blue; tail feathers blue, the central pair having narrow white tips, which increases in extent towards the outermost feathers; feathers below the eye and the ear-coverts pale silvery turquoise blue; throat deep cobalt, followed by a narrow black crescentic band which widens out on the sides and connects with the black collar on the hind-neck; remainder of the under surface and under tail-coverts light cobalt-blue; bill black; legs and feet brownish-black; iris black. Total length 4.6 inches, wing 2, tail 2.25, bill 0.32, tarsus 0.8.*

ADULT FEMALE—*Above brown; tail feathers dull blue; lores and feathers around the eye pale rufous; all the under surface buffy-white, darker on the sides of the body and the abdomen. Total length 4.3 inches.*

Distribution.—Queensland, Western New South Wales, South Australia, Central Australia.

THE Turquoise Superb Warbler chiefly inhabits the inland portions of the continent. It is found in South Australia, where the type was obtained, Central Australia, western New South Wales, and the south-western portion of Queensland. It is represented in the Australian Museum collection by adult males obtained to the north-west of Port Augusta, and from various other localities in South Australia; by specimens procured by Mr. James Ramsay at Tyndarie, New South Wales; and by a mutilated skin of an adult male from Deering Creek, Central Australia. This series has been supplemented by five males kindly lent by the Trustees of the South Australian Museum, Adelaide. Two old males, collected at Port Germein by Mr. M. Murray, are in beautiful plumage, and have the head, mantle, upper portion of the back, and upper tail-coverts of a very rich turquoise-blue; the quills are more strongly washed with greenish-blue, and the margins of the upper wing-coverts with a more decided tinge of blue, and are equally rich in colour as the Central Australian examples. Another male, from the same locality, collected by Dr. A. M. Morgan, in October, 1866, has the mantle more circumscribed, and the blues of the upper and under parts of a slightly paler shade. Mr. C. W. De Vis, has also sent me for examination an adult male from Queensland, but from what locality it was procured is not known.

Mr. G. A. Kearland has recently forwarded to me, for examination, a very old male obtained in Central Australia. It is one of the most beautiful specimens I have seen, and in addition to its darker and more richly coloured tints of plumage, has the velvety-black crescentic band on the fore-neck very broad. The specimens from Port Germein and Central Australia are darker in colour than examples obtained in other parts of the continent, and are very unlike Gould's figure of this species in his "Supplement to the Birds of Australia." The latter more closely resembles in colour the not quite adult male which may be distinguished by the paler silvery turquoise-blue shade of the head, mantle, and ear-coverts. In the "Zoology of the Horn Expedition," I erroneously attributed these richer-plumaged birds from Central Australia to *Malurus melanotus*. I feel certain, too, that the birds observed by the late Mr. K. H. Bennett, near the Barrier Range, South Australia, and regarded by him as *M. splendens* were *M. callainus*.

In no species of the genus does the colour in the adult males vary so much with age as in the Turquoise Superb Warbler; the older they are the darker in colour they become in the shades of blue in those parts of the upper and under surface, and the wings are more strongly washed with greenish-blue. This variation is more apparent in the cobalt-blue colour of the under parts. In five adult males now before me, there are not two specimens with the breast and abdomen of the same shade of cobalt. The deep cobalt throat in adult males, in contrast to the remainder of the under surface, which is light cobalt-blue, will however serve to distinguish this species from any other of the blue-breasted species belonging to this genus.

Regarding this species, Mr. Kearland writes me:—"Across Central Australia, from about fifty miles north of Charlotte Waters to some distance north of Alice Springs, *Malurus callainus* is found freely dispersed through scrub and salt-bush, but more especially along the creeks at Hermannsburg and Ilamurta. Mr. C. E. Cowle informs me that at times the three species, *M. assimilis*, *M. callainus*, and *M. leucopterus*, arrive in such numbers that they are disturbed from almost every bush along the gorges in the ranges near his quarters, but when protracted hot weather prevails they all disappear and are not seen again until rain falls. The genus is a very sociable one, and two or more species are often seen on the same bush. In fact on several occasions I have killed two species at one shot. *M. callainus* is, as a rule, more partial to the vicinity of water than most other representatives of the genus I have met with. These birds generally moult during June and July, and are in perfect plumage in August and September."

Early in August, 1900, Dr. A. M. Morgan and Dr. A. Chenery found it very abundant at Oakden Hills about one hundred and five miles north-west of Port Augusta, South Australia. The adult males had just obtained their full plumage, and although these birds were usually seen in pairs, no nests were found.

The nests of this species are formed throughout of soft dead grey grasses, intermingled with silky-white and brown plant down, the latter material also being used as a lining for the bottom of the nests. An average nest measures four inches and three-quarters in height by three inches in breadth. Those found by Mr. C. E. Cowle, at Illamurta, Central Australia, were built in low bushes, but one his black boy took was placed in a mulga, six feet from the ground. Each of these nests contained four eggs. Mr. Cowle writes:—"All our *Maluri* here, the females of each species of which are indistinguishable from one another, generally build in a salt-bush, tangled cane grass, or a dead acacia fallen close to the ground, and lay four eggs. The breeding season commences in November, and lasts until the end of April."

The eggs are usually four in number for a sitting, oval or rounded-oval in form, the shell being close-grained, smooth, and lustreless. The ground colour, which varies from a dull to clear white, is finely freckled, spotted, or blotched with different shades varying from a bright red to dull reddish-brown. Some specimens have the markings small but very distinct and evenly distributed over the surface of the shell; generally, however, they are more thickly disposed on the larger end, where in some instances they form large coalesced patches, or a more or less irregularly formed zone. Occasionally eggs are found which have the markings rounded in form and of a rich reddish-black, and somewhat resembling in character and colour the eggs of *Ephthianura aurifrons*. A set of four, taken by Mr. C. E. Cowle, on the 14th November, 1895, at Illamurta, Central Australia, measures:—Length (A) 0.63×0.48 inches; (B) 0.62×0.48 inches; (C) 0.63×0.5 inches; (D) 0.64×0.49 inches. Another set of three, taken in the same locality in March, 1896, and which also contained an egg of the Rufous-tailed Bronze Cuckoo, measures:—(A) 0.65×0.48 inches; (B) 0.64×0.51 inches; (C) 0.64×0.5 inches. A set of three, taken by Mr. James Ramsay at Tyndarie, New South Wales, in October, 1879, measures as follows:—Length (A) 0.67×0.48 inches; (B) 0.67×0.48 inches; (C) 0.66×0.48 inches. A set of two, taken in the same district, and which also contained an egg of the Rufous-tailed Bronze Cuckoo (*Lamprolaima basalis*), measures:—(A) 0.64×0.47 inches; (B) 0.65×0.46 inches. A set of three, taken by Mr. C. E. Cowle at Illamurta, Central Australia, and on which the male bird was captured while sitting, measures:—(A) 0.6×0.5 inches; (B) 0.63×0.48 inches; (C) 0.64×0.46 inches. An egg of the Rufous-tailed Bronze Cuckoo was also deposited in the nest from which these eggs were taken.

Young males may be distinguished by the much paler and silvery-blue shade of the crown of the head, mantle, upper tail-coverts, and ear-coverts; and the mantle also is more circumscribed. Wing 1.92 inches.

In Western New South Wales, October and the two following months constitute the usual breeding season of this species.

Malurus splendens.

BANDED SUPERB WARBLER.

Traquet resplendissant, Quoy et Gaim., Voy. de l'Astrol., Atlas, pl. 10, fig. 1.

Saricola splendens, Quoy et Gaim., Voy. de l'Astrol., Tom. I, p. 197 (1830).

Malurus splendens, Gould, Bds. Austr., fol., Vol. III., pl. 21 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 323 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 289 (1879).

ADULT MALE—General colour above rich lustrous cobalt, the fore part of the head distinctly shaded with turquoise-blue; lores, sides of crown and neck, and a broad nuchal collar black; upper

wing-coverts and quills brown, washed externally with greenish-blue; the inner wing-coverts and inner secondaries margined with cobalt-blue; tail feathers blue, their basal half having a distinct greenish shade, the lateral feathers narrowly edged with white at the tips; feathers below the eye and the ear-coverts bright turquoise-blue; all the under surface rich cobalt, slightly darker on the throat, and with a well defined black band on the fore-neck, which joins at the sides with the black nuchal collar; bill black; legs and feet dark brown; iris black. Total length 5.2 inches, wing 2.1, tail 2.5, bill 0.4, tarsus 0.2.

ADULT FEMALE—Above brown; wings brown, the quills narrowly edged externally with light ashy-green; tail feathers dull greenish-blue, narrowly edged with white at the tips; lores and feathers around the eye rufous; all the under surface dull white, slightly tinged with brown; flanks, thighs, and under tail-coverts brown; bill reddish-brown; legs and feet fleshy-brown.

Distribution.—Western Australia.

THE Banded Superb Warbler is one of the most beautiful species of the brilliantly coloured members of the genus *Malurus*. It was discovered at King George's Sound by MM. Quoy and Gaimard, and is accurately figured and described by those writers in the "Voyage de l'Astrolabe." While collecting in the same locality in October and November, 1808, on behalf of the Trustees of the Australian Museum, Mr. George Masters succeeded in obtaining many adults of both sexes, also young birds. Mr. Masters informs me that he found them plentifully distributed throughout the scrubby undergrowth near the coast, and frequenting the same situations as *M. dichrous*, and they were easily allured within shooting range by imitating their note. Like *M. dichrous*, he never found it further inland than thirty miles from the coast.

Writing of this species, Gould remarks:—"It breeds in September and the three following months; the nest is constructed of soft dried grasses, and lined either with hair, wool, or feathers, the cover of the top resembling the peak of a cap, and is about six or eight inches in height; the eggs are generally four in number, of a flesh-white, thickly blotched and freckled with reddish-brown, especially at the larger end; eight and a quarter lines long, by six and a quarter lines broad. The situation of the nest is much varied, being sometimes built among the hanging clusters of the stinkwood tree, at others among the upright reeds growing just above the water's edge on the borders of lakes and the banks of rivers."

Young males resemble the females in plumage, but the bill is slightly darker, the lores and feathers around the eye have only a wash of rufous, and the tail feathers are more tinged with blue. Wing 1.9 inches. In their progress towards maturity, cobalt-blue feathers are intermingled with the entire plumage of the upper and under surface, and there is a small patch of black feathers on the sides of the neck. Wing 2 inches.

Malurus leucopterus?

WHITE-WINGED SUPERB WARBLER.

Malurus leucopterus, Quoy et Gaim., Voy. de l'Uranie, p. 108, pl. 23, fig. 22; Gould, Bds. Austr., fol., Vol. III, pl. 25 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 330 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 290 (1865); North, Rec. Austr. Mus., Vol. IV., p. 209 (1902).

ADULT MALE—General colour above and below deep cobalt blue, the under surface being of a slightly clearer blue than the upper; a small tuft of feathers on the sides of the upper breast, the scapulars, inner secondaries, and inner wing-coverts pure white, the outer coverts brown washed with blue; quills brown, externally edged with light greenish-blue; the inner secondaries next the white ones dark blue on their outer webs, except a narrow edge; tail feathers dark blue; bill black; legs brown, feet dark brown; iris black. Total length in the flesh 4.8 inches, wing 1.85, tail 2.4, bill 0.35, tarsus 0.8.

* Handbk. Bds. Austr., Vol. I., p. 323 (1865).

ADULT FEMALE.—Above brown; upper wing-coverts and quills brown, with paler edges to the outer webs of the primaries; tail feathers brown, washed with dull blue; sides of the head and neck brown; all the under surface dull white tinged with brown; sides of the body brown; bill light brown; legs brown, feet dark brown; iris dark brown.

Distribution. — Queensland, New South Wales, Victoria, South Australia, Central Australia, Western Australia, North-western Australia.

THE foregoing descriptions and the accompanying remarks apply to the birds figured and described by Gould in his folio edition of the "Birds of Australia," Vol. III., Plate 25. With that writer, however, I agree in questioning very much the propriety of referring them to the *Malurus leucopterus* of Quoy and Gaimard.

This species is chiefly an inhabitant of the inland portions of the Australian continent, especially over its southern half. It is freely dispersed in favourable situations throughout south-western Queensland, western New South Wales, north-western Victoria, Central, South, and Western Australia. Mr. Tom Carter has found it breeding at Point Cloates, but it was not represented in any of the large collections made further north, near Derby, by Mr. E. J. Cairn, the late Mr. T. H. Bowyer-Bower, and the Calvert Exploring Expedition, neither have I seen specimens from any part of Northern Australia.

Writing from the Mossgiel District in western New South Wales, in 1886, the late Mr. K. H. Bennett remarks:—"The White-winged Wren is rather plentifully dispersed over the wide plains of this locality, especially those which are covered with saltbush from a foot to eighteen inches high, or the curious formations known as 'cane-swamps.' Although the birds may be in these spots for years, they never go out of them, the margins of open ground forming the boundary of their little domain. In this respect they differ from *M. melanotus*, and the chestnut-shouldered species, which are never found in such situations, though they may inhabit the dense scrub surrounding these open spaces, only a few yards distant. *M. leucopterus* is also sparingly met with in the timbered back country as well as the open plains. It breeds in September and October, constructing a dome-shaped nest of dried grasses and other soft material, lined with feathers, and laying four eggs."

Mr. G. A. Kearland writes me:—"During the journey of the Horn Scientific Expedition in Central Australia, in 1894, we found *Malurus leucopterus* frequenting the short dry heath and spinifex between Oodnadatta and Charlotte Waters, and from the east of Alice Springs to as far north-west as Carmichael's Creek. When the notes of these birds are first heard, the females and immature males generally hop about and expose themselves as if to attract attention. Meanwhile the adult male, in his gay livery, either runs under the shelter of the undergrowth, or flies off to a place of safety. As soon as the latter object is gained, the others follow one at a time. When a brown bird flies off it is almost a sure sign that the adult male has gone. I always found the adult males very shy except at nesting time. These birds are plentiful near the Finke River, but on several occasions I have found them many miles from the nearest water. They are also very numerous in many parts of Western Australia. During the journey of the Calvert Exploring Expedition in 1896, we found three nests with fresh eggs in September, and some splendid specimens were obtained at Separation Well, on the 10th October, 1896."

In company with Mr. J. A. Thorpe, I procured specimens near the Mehi River, New South Wales, in November, 1897. Later on I obtained them in all stages of plumage near the Gwydir River. They were met with both in small flocks and in pairs, frequenting the isolated clumps of low bushes out on the plains, and in which I found them breeding. It is remarkable that some of the adult males were in full plumage, others were moulting their tail feathers,

* Since described as *M. assimilis*.

some of them being about half-grown and much darker in colour than the old remaining feathers. I also obtained a young parti-coloured male on the 9th November in almost the same stage of plumage as a specimen obtained by Mr. R. Grant, at Buckingham, about two hundred and eighty miles away, in July of the same year. The stomachs of all the birds we examined contained minute insects.

Dr. A. M. Morgan informs me that during a trip made to the Gawler Ranges, South Australia, in August, 1902, by Dr. A. Chenery and himself, this species was not met with further west than forty-five miles from Port Augusta. At Wartaka West a pair were found roosting in an old nest of *Pomatostomus superciliosus*.

Writing to me from Point Cloates, North-western Australia, Mr. Tom Carter remarks:—“*Malurus leucopterus* is most frequently seen of any of the *Maluri* here. It was especially numerous in 1898, after a hurricane, when a great growth of ‘roley-poley’ bush sprang to a considerable size, and many of its nests were found in it. I have seen full plumaged males in almost every month of the year. They are not so easy to approach as the duller coloured females and immature birds. They sleep in small families in thick bushes, and often keep uttering their pretty warble through the night, especially if any noise is made near them.”

The nest is a dome shaped structure, with an entrance near the top. It is formed externally of soft dried grasses and dead flowering plant-stalks, slightly matted together with silky-white plant-down, and is usually thickly lined inside with the latter material, at other times with feathers or wool according to the situation in which it is built. Some nests have the tops slightly protected with a hood, but as a rule the entrance is oval and large for the size of the nest, like that of *M. lamberti*. An average nest measures externally four inches and a half in height by three inches in width, and the entrance one inch and a half in height by one inch in width. It is usually placed in a low bush, within two or three feet of the ground, but I have known them to be taken at a height of five feet. In New South Wales, salt-bushes, cotton-bushes, and “roley-poley” bushes are favourite nesting sites.

The eggs are usually four in number for a sitting, and vary from oval to rounded and elongate-oval in form, the shell being close-grained, and its surface smooth and almost lustreless. When fresh they are of a fleshy-white ground colour, which changes to pure white when emptied of their contents; the shell is finely spotted or blotched with dull red or reddish-brown, the markings predominating on the larger end, where a more or less well defined zone or cap is frequently formed. Some specimens are minutely but sparingly dusted or peppered all over with pinkish-red, and occasionally others may be found which are entirely devoid of markings. A set of four, taken in October, 1884, in the Wimmera District, Victoria, measures: Length (A) 0.6×0.47 inches; (B) 0.62×0.47 inches; (C) 0.58×0.46 inches; (D) 3.57×0.46 inches. Another set of four, taken by me on Tyreel Station, near Moree, on the 9th November, 1897, measures:—(A) 0.62×0.44 inches; (B) 0.64×0.45 inches; (C) 0.64×0.75 inches; (D) 0.62×0.44 inches.

The Narrow-billed Bronze Cuckoo frequently deposits its egg in the nest of this species.

Young males resemble the female. Some examples from South Australia have the upper surface strongly washed with rich fawn colour. As a rule their darker blue tail and the white scapulars are the first signs of acquiring the distinguishing plumage of the male, but specimens are also found with only a few of the feathers on the crown of the head tipped with cobalt-blue, and the remainder of their plumage as in the adult female. Excepting the tail feathers, the change in the male from youth to the fully adult livery is mostly if not wholly assumed by a change of colour in the feathers and not by moult. Thus in the semi-adult stage, specimens may be found with the brown and dull white body plumage of the female, and

the tips of more or less of the feathers of a rich cobalt-blue; inner wing-coverts and secondaries white, with brown centres.

September and the four following months constitute the usual breeding season of this species in Eastern Australia; but in the central portion of the continent, Mr. C. E. Cowle has found nests with fresh eggs in March and April.

Malurus leuconotus.

WHITE-BACKED SUPERB WARBLER.

Malurus leuconotus, Gould, Proc. Zool. Soc., 1865, p. 198; *id.*, Handbk. Bds. Austr., Vol. I., p. 332 (1865); *id.*, Bds. Austr., fol., Suppl., pl. 24 (1869); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 291 (1879).

ADULT MALE—*Like the adult male of MALURUS LEUCOPTERUS, but of a slightly brighter cobalt-blue, and having the centre of the back white instead of deep cobalt-blue, as in that species. Total length 4·7 inches, wing 1·9, tail 2·4, bill 0·32, tarsus 0·8.*

Distribution.—Western New South Wales, South Australia, Western Australia, North-western Australia.

IN his original description of *Malurus leuconotus*, Gould describes the secondaries as being white. Dr. Sharpe, in the "Catalogue of Birds in the British Museum,"* states that the innermost secondaries are pure white, the outer one brown on the inner web, white on the external one." The tail measurement in Gould's original description (3½ths) is clearly a typographical error, which is perpetuated in his Handbook, for in his "Supplement to the Birds of Australia," where the figures are stated to be of the natural size, the tail is there represented as being about two inches and a half in length. Although I have examined specimens from various localities resembling *Malurus leucopterus*, Gould, and differing in having the upper portion and centre of the back white, I am by no means certain that they are distinct from that species. This is strengthened by the knowledge that they were obtained in some instances in districts where *M. leucopterus* is also found. Among the adult males now before me belonging to this white-backed form, are examples from the north-west of Port Augusta, obtained by Mr. Kendal Broadbent, who in the same locality procured numerous specimens of *M. leucopterus*: adult males and a female, obtained with their nests and eggs, by Mr. James Ramsay at Tyndarie, New South Wales, in 1881-2; these were originally spirit specimens, and the adult female is indistinguishable from that of *M. leucopterus*, which is plentiful in the district; an adult male, collected by Mr. G. A. Keartland during the journey of the Calvert Exploring Expedition in Western Australia in 1896, and two adult males obtained by Mr. Edwin Ashby at Nackara, South Australia in 1900.

Referring the birds obtained at Tyndarie, New South Wales, to *M. leuconotus*, the nest is thus described by Dr. Ramsay †:—"The nest, like that of all other members of the genus, is a dome-shaped oblong structure of fine grass, ornamented and mixed with cobweb and wool, and lined inside with cotton from the native 'cotton-bush,' or the silky-down from the seed-pods of an *Asclepiad*. The length of the nest is 5·5 inches by 3·3 inches, and it was placed in a small tuft of coarse grass near the ground; others were found among the lower branches and grass at the base of cotton-bush shrubs. They breed during the months of September, October, and November."

Four eggs, comprising a set taken by Mr. James Ramsay, are oval in form, the shell being close-grained and its surface smooth and lustreless. They are pure white, with the exception

* Cat. Bds. Brit. Mus., Vol. iv., p. 291 (1879).

† Proc. Linn. Soc. N.S.W., Vol. vii., p. 49 (1883).

of one which has a faint reddish-tinge, and are minutely freckled and spotted with dull red, particularly towards the larger end, where the markings are darker and become confluent, forming small angular shaped patches in one specimen and a well defined zone on another. Length (A) 0.62×0.45 inches; (B) 0.62×0.46 inches; (C) 0.6×0.45 inches; (D) 0.6×0.46 inches. Although slightly darker than typical specimens of *M. leucopterus*, they cannot otherwise be distinguished from the eggs of that species.

Malurus lamberti.

LAMBERT'S SUPERB WARBLER.

Malurus lamberti, Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 221 (1826); Gould, Bds. Austr., fol., Vol. III., pl. 24 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 327 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 288 (1879).

ADULT MALE.—*Forehead, feathers around the eye and ear-coverts turquoise-blue, which gradually passes into cobalt on the crown of the head and nape; sides of the neck, and a collar on the hind-neck velvety black; mantle and upper portion of the back cobalt-blue; lower portion of the back, rump, and upper tail-coverts velvety black; scapulars bright chestnut; upper wing-coverts and quills brown, the inner secondaries having dull rufous edges; tail dull blue, the lateral feathers tipped with white; a triangular shaped marking in front of the eye, cheeks, throat, and upper portion of the breast deep black, the feathers on the sides of the latter deep cobalt; centre of the breast dull white; abdomen, flanks, and under tail-coverts brownish buff; bill black; legs and feet dark fleshy-brown; iris dark brown. Total length in the flesh 5.8 inches, wing 1.9, tail 3, bill 0.4, tarsus 0.85.*

ADULT FEMALE.—*General colour above brown; upper wing-coverts and quills brown, the primaries narrowly edged externally with brownish-white; tail feathers dull blue; lores and a circle of feathers around the eye rich chestnut; chin, throat, sides of the neck, and all the under surface fulvous-brown, paler on the throat, darker on the sides of the abdomen and flanks; bill reddish-brown; feet fleshy-brown; iris dark brown.*

Distribution.—Queensland, New South Wales.

THERE are five species of the genus *Malurus*, of which the adult males have the shoulders chestnut or chestnut-red. These may be further separated into two sections, consisting of the black throated species *M. lamberti*, *M. amabilis*, and *M. assimilis*; and the dark blue throated birds, *M. elegans* and *M. fulcherrimus*, which are strictly confined to the western portions of the continent. It is remarkable that while the adult male of *M. amabilis* somewhat resembles in colour the adult male of *M. lamberti*, the adult female of the former species is distinguished not only from those of its ally, but from all others of the genus in having the general colour of the upper parts dark blue.

Lambert's Superb Warbler is the oldest known species of the chestnut shouldered section of the genus, and since I have separated the closely allied *Malurus assimilis*, there is very little variation to be found in examples from different parts of Eastern Australia. As in other species of the genus, the small white tips to the tail feathers of the adult males and females vary in extent, and in some examples they are entirely wanting. Prior to moulting, the tail feathers in both sexes are much duller in colour, and almost approach in colour those of very young birds.

The range of the present species extends from the neighbourhood of Wide Bay in South-eastern Queensland, throughout the greater portion of Eastern New South Wales. In the latter State it is more freely dispersed in the scrubby undergrowth near the coast, and its range does not extend far inland. As at the time of Gould's visit to Australia, the stunted vegetation and heath lands about Botany Bay and Middle Harbour are still its favourite haunts near

Sydney, but unlike *Malurus superbus*, it no longer inhabits the gardens and parks of the city. Mr. George Masters, the Curator of the Macleay Museum, informs me that the garden surrounding the residence of the late Sir William Macleay at Elizabeth Bay was one of the last resorts of this species, adjacent to the city, and it was there exterminated by domestic cats.

Although by no means common, it is generally distributed throughout the upper Middle Harbour District, and the neighbouring suburbs on the Milson's Point railway line. At Roseville I have found it breeding in the orchards, and in one instance close to the road of one of the leading thoroughfares. In habits it is warier than the Superb Warbler, which is often found in the same localities, and as with that species its usual food consists of insects of various kinds and their larvæ.



NEST AND EGGS OF LAMBERT'S SUPERB WARBLER.

The note of the male resembles the sound produced by the turn of a child's small spring rattle, or the winding of a small clock.

The nest is an oval dome shaped structure, with an enlarged entrance near the top or in the side; externally it is formed of thin dried strips and broad scales of bark with a few dried grass stalks and egg bags of spiders, the interior being lined with very fine dried grass and bark, interwoven with a small quantity of hair or fur; others are lined with silky-white downy seeds or other soft material. It is neither so neatly woven nor warmly lined as that of *Malurus superbus*, and as a rule nothing but dead and dull-coloured material is used in its outer construction.

An average nest measures externally five inches and a half

in height by three inches and a half in diameter; entrance one inch and a half. Typically the entrance to the nest is much enlarged, and the structure is narrower on the lower half. One I found at Middle Harbour, on the 29th September, 1899, built a few inches from the ground in a Dwarf Apple-tree (*Angophora cordifolia*), had the entrance two inches in diameter, and the cavity below the opening only one inch and three-quarters in diameter by two in depth, and directly I flushed the female from it I could see three fresh eggs lying at the bottom of the nest. It is generally built within a few inches of the ground, and is loosely attached to the stems of a low bush, coarse grass stems, or clump of ferns, or to a few dry twigs fallen among long dead grass, and often near a log. Although comparatively rare in the neighbourhood of Sydney, nearly all the nests I have found were in more exposed situations than as a rule are the nests of the common *Malurus superbus*. I found the nest figured above on the 13th August, 1900, at Middle Harbour, when only a few thin strips of bark were laid in some long grass sheltered above by a low gum sapling. I examined it several times during the next few weeks, and although added to since I first found it, thought it was deserted, as the birds were always in different parts of the scrub far removed

from the nest. Visiting it on the 1st October, seven weeks after it was first commenced, I was surprised to flush the female from it, who was sitting on four partially incubated eggs. After photographing the nest on the following day, the female returned to her eggs as soon as I removed the camera. These birds will often desert their nests if touched, and sometimes if even approached during construction. A pair from whose nest I took four fresh eggs on the 27th September, 1900, at Roseville, I found again with a half built nest on the 14th October, in some long grass under the fallen dead branches of a pear-tree, by watching the female carry material to it. Although eventually nearly completed, the birds deserted it and constructed another nest and reared their young in some low ferns, about one hundred yards away. In all nests I have found, the eggs or young were more or less exposed to view, but two which had frail hoods partially concealing the entrance.

A nest I found near Roseville on the 1st September, 1901, and from which I flushed the female when within five yards of it contained a single fresh egg. As usual the entrance to the nest was large, and I could see the egg lying inside at the bottom of the structure, which I was careful not to touch. On visiting the place a week later, I saw the male and female in the scrub about thirty yards from the nest. Arriving at the nest I was surprised to find it empty, and two perfect eggs at some distance apart lying beneath it on a thick carpeting of dead eucalyptus leaves. Carefully removing the latter one by one I found a third egg, and after some time a fourth, all of them being perfect, fresh, and icy cold. Whether the birds had ejected the eggs themselves through my visiting it, or whether they had been thrown out by a Cuckoo, I can only conjecture, but if by the latter one would have expected to find an egg of the intruder in the nest, which was in a perfectly upright position.

At Middle Harbour, on the 9th September, 1901, I observed a female in low scrub tearing off small strips of bark and bark-fibre from a tea-tree, the male hopping about in a tree close at hand. This she repeated several times until I located the nest she was engaged in building in some long grass at the foot of a *Banksia*, about twelve yards away. I gradually moved until I got within a yard of the structure, the female still carrying material but now small dead eucalyptus leaves, apparently unconcerned at my presence. Now and again she would run up to the top of a shrub, watch me for a minute or two and then fly away, returning shortly after with a leaf or portion of one. Meanwhile the beautiful full plumaged male kept hopping about the bushes near at hand, sometimes close to me at other times accompanying the female, but never assisting in carrying material nor did he once go near the nest during my stay there. On visiting the nest on the 20th September, I found it completed and containing two fresh eggs, which were visible at the bottom of the nest. Two days later I flushed the female from it, and found in addition to the eggs of Lambert's Superb Warbler, an egg of the Fan-tailed Cuckoo which almost filled up with the other eggs the lower cavity of the nest. This is the only instance I have known of the egg of *Cacomantis flabelliformis* being deposited in the nest of this species. Subsequently Dr. Ramsay, to whom I showed this set, informed me that he had only on one occasion found the nest of Lambert's Superb Warbler, which contained two fresh eggs, this was on the 16th September, 1860, and that he had never known or heard of the egg of any species of Cuckoo being found in the nest of *Malurus lamberti*.

At Roseville, on the 16th October, 1901, I found a nest built in some grass about two feet high growing under a dead pear tree. I had the owners of it under almost daily observation for over twelve months, and never at any time saw the male except in his fully adult and distinguishing livery. Although these birds never left the orchard or the adjoining paddock, like many other pairs of these birds I have had under observation when engaged in nest building, they wandered all over their domain, and only on one occasion had I observed them in the vicinity of where I found their nest. This nest had the entrance slightly more protected

than usual, but not enough to conceal the eggs from view when looking into it. I flushed the female from it when I was about a yard away, and found she had been sitting on three of her own eggs, also on one of *Lamprococyx basalis*. The male exhibited the most concern about the welfare of the nest and its contents. He came within eighteen inches of my hand, holding in his bill a common house-fly; with head and tail lowered he ran sideways up and down a coarse grass stalk while I was removing the eggs. The eggs were of the usual reddish-white ground colour before being blown, and incubation had commenced in all of them, including the Rufous-tailed Bronze Cuckoo's. One egg of *Malurus lamberti* was entirely devoid of markings. I saw the female of this pair of birds building again in some long grass near my house, on the 25th October, a thin outline only of the nest at that time being formed. On the 6th November it was completed, and contained two eggs, both birds being near the nest. Two days later there were three eggs of Lambert's Superb Warbler and one of *Lamprococyx basalis*. Cuckoos were unusually numerous that season, and on the same day in an adjoining paddock I saw a young *Lamprococyx basalis* being fed by a female Lambert's Warbler.

At Middle Harbour, on the 27th October, 1902, I watched for some time a pair of these birds; the female was making a tremulous motion of the wings which led me at first to believe it was a young one. Afterwards I found the nest, about half built, among grass and sheltered with a few low herbaceous plants. On the 8th November I flushed the female from it while sitting on three of her eggs, also an egg of the Rufous-tailed Bronze Cuckoo. While I was at the nest, the female a few yards away, with drooping head and tail, ran sideways up and down a thin reed. This nest, of the usual form, was entirely constructed of dead grey strips of bark and a few egg-bags of spiders, being lined inside with a thick layer of red downy tufts of *Banksia* cones; and on the top of that, and on which the eggs were deposited, a small quantity of soft white inner bark of a tree. It measured externally five inches in height, three inches in diameter, and across the entrance one inch and a half. The eggs in this nest were not visible without raising a slight hood which protected the entrance, and one egg of this set was entirely devoid of markings.

On the same day I found another nest of this species, which I had previously tried for some time to locate. It was most artfully concealed, about a foot below the level of the surrounding paddock, in the side of a narrow deep drain, overgrown with grass and bracken ferns, and contained a young Rufous-tailed Bronze Cuckoo, nearly fledged. Below the nest, in the bottom of the drain, I found an egg of *Malurus lamberti* in an advanced stage of incubation. Both male and female came close to me with insects in their bills for the young Cuckoo, the former as usual betraying the most concern at my presence, and more especially when I took the young bird out of the nest to examine it.

The eggs are usually four, sometimes only three in number for a sitting, oval or elongate oval in form, the shell being close-grained, smooth, and almost lustreless. When fresh they are of fleshy or reddish-white ground colour, which changes to nearly pure white when emptied of their contents; this is sprinkled over with dots, spots, and occasionally blotches of pale red, pinkish-red, or dull chestnut-red, the markings as a rule being confined to the thicker end, where they not infrequently form a well defined cap or zone. Some specimens have the markings small and sparingly distributed over the entire shell and often an egg of this type is found in a set in which the others are heavily blotched or distinctly zoned. A set of three, taken at Middle Harbour on the 20th September, 1899, measures as follows:—Length (A) 0.66 × 0.5 inches; (B) 0.66 × 0.5 inches; (C) 0.69 × 0.5 inches. A set of four, taken at Roseville on the 27th September, 1900, measures:—(A) 0.65 × 0.5 inches; (B) 0.64 × 0.49 inches; (C) 0.63 × 0.49 inches; (D) 0.64 × 0.5 inches. A set of three, taken at Roseville on the 8th November, 1902, and which also contained an egg of *Lamprococyx basalis*, measures:—(A) 0.64 × 0.5 inches; (B) 0.64 × 0.49 inches; (C) 0.64 × 0.49 inches.

Young birds resemble the female, but are slightly browner on the under parts, and have the tail feathers brown, and the lores and orbital ring duller in colour. At Roseville on the 6th February, 1899, I observed a fully adult male and female, with three young ones in brown attire. What I believed to be the same brood with their parents, I saw near the same spot on the 3rd March following. Two of them were young males and had the tail dull blue and the bill black; the adult female being distinguished from a young female by the deeper rufous orbital ring and reddish-brown bill.

The young male of this species, in its progress from youth to maturity, undergoes the same series of changes as does the young males of *Malurus superbus*. In some young males the chestnut scapulars are the first indications of their assuming the adult livery; in others it is exhibited in the turquoise-blue feathers on the head, or black feathers of the throat.

Nidification in the neighbourhood of Sydney usually commences in the beginning of August, and is, so far as I have observed, performed only by the female. Neither does the male assist in the task of incubation, but he shares with the female in feeding the young. The eggs are generally deposited daily; in several nests, however, I have had under observation, they were irregularly laid. At Chatswood I have known a female to sit so close as to be captured while sitting on fresh eggs, but as a rule she leaves the nest silently on one approaching it. On the 28th September, 1878, at Roseville, I caught a young bird that had only recently left the nest. The male evinced the greatest solicitude for the welfare of the young bird, and ventured within a foot of my hand. With drooping wings and tail it assumed the most droll attitudes, and tumbled over the ground in a seemingly helpless condition. While holding the young bird in my hand, and before restoring it to liberty, it answered the male and female who were calling with their usual note. The latter, however, would not come nearer than four yards of me, while I could almost touch the male.

In the coastal districts of Northern New South Wales, August and the four following months, constitute the usual breeding season. My last record of finding a nest of this species was on the 16th December, 1903. It was built near the ground under a small bush close to a well frequented path leading to Middle Harbour. Both male and female were engaged in feeding the only occupant of the nest, a young Rufous-tailed Bronze Cuckoo (*Lamprolaima basalis*).

Malurus assimilis.

PURPLE-BACKED SUPERB WARBLER.

Malurus pulcherrimus (nec Gould), Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 294 (1879).

Malurus lamberti (nec Vig. and Horsf.), Ramsay, Proc. Linn. Soc. N.S.W., 2nd ser., Vol. II., p. 168 (1887); North, Rep. Horn Sci. Exped. Centr. Austr., Pt. II, Zool., p. 77 (1896); Kearthl., Trans. Roy. Soc. S.A., Vol. XXII., p. 175 (1898).

Malurus assimilis, North, Viet. Nat., Vol. XVIII., p. 29 (1901).

ADULT MALE—Forehead, crown and sides of the head purplish-blue, passing into a rich cobalt on the feathers around the eye and the ear-coverts; sides of the neck and a collar on the hind-neck velvety-black; mantle and upper portion of the back purplish-blue; lower portion of the back and rump velvety-black; scapulars chestnut-red; wings brown, the quills narrowly edged externally with brownish-white; tail dull blue, all but the two central feathers tipped with white; a triangular-shaped marking in front of the eye, the cheeks, throat, and upper portion of the breast deep black, the feathers on the sides of the breast tipped with deep purplish-blue; remainder of the under surface dull white, slightly tinged with pale brownish-buff on the flanks and under tail-coverts; thighs

brown; bill black; legs and feet dark fleshy-brown; iris dark brown. Total length 5 inches, wing 1.9, tail 2.8, bill 0.55, tarsus 0.8.

ADULT FEMALE.—General colour above brown; wings brown; the quills narrowly edged externally with brownish-white; tail dull greenish-blue, the lateral feathers tipped with white; a broad local streak and a narrow circle of feathers around the eye rich chestnut; chin and upper portion of the throat dull white; remainder of the under surface pale fulvous; bill reddish-brown; legs fleshy-brown, the feet slightly darker; iris dark brown. Total length 4.8 inches, wing 1.8, tail 2.15, bill 0.53, tarsus 0.8.

Distribution.—Northern Territory of South Australia, Queensland, New South Wales, Victoria, South Australia, Central Australia, Western Australia, North-western Australia.

FOR a number of years past it has been known that the inland and western form of *Malurus lamberti* was of a deeper colour than typical specimens obtained near the eastern coast of Australia. More than a quarter of a century ago, Dr. Ramsay pointed out that the New South Wales birds differed in the tint of colouring from those procured in South Australia. Subsequently, in 1876, Mr. George Masters made reference to two specimens obtained by Mr. Kendal Broadbent at the Gulf of Carpentaria, and stated that it might prove to be a distinct species, but for the present (at that time) he looked upon it as a local variety of *Malurus lamberti*.^{*} These differences in colour were brought more prominently under my notice in 1901, while working at the *Maluri* and comparing a series from widely separated parts of the continent.

The present species belongs to that section of the genus in which the adult males are distinguished by their chestnut shoulders, and is more closely allied to *Malurus lamberti*. When compared with typical examples of the latter species, however, *M. assimilis* may be easily recognised in having the crown and sides of the head purplish-blue instead of deep cobalt; moreover, the feathers around the eye and the ear-coverts are rich cobalt instead of turquoise-blue, and the mantle and upper portion of the back purplish-blue instead of cobalt-blue. In the colour of these parts it more closely resembles *M. pulcherrimus*, Gould, with which it has been frequently confused. Both Western Australian representatives of this section of the genus, however, *M. pulcherrimus* and *M. elegans*, are widely separated from *M. lamberti* and its allies in having the throat and upper portion of the breast dark blue instead of black.

Malurus assimilis has an extensive range over the Australian continent. Mr. K. Broadbent obtained specimens near Port Augusta in South Australia, also at the Gulf of Carpentaria in North Queensland. The late Mr. K. H. Bennett procured the types in the thick scrubby undergrowth of the Mossgiel District, New South Wales, where he found this species breeding; and, later on, at Yandembah Station, near Booligal. Mr. James Ramsay also obtained examples of this species, together with its nest and eggs, at Tyndarie. Mr. G. A. Keartland met with it in Central Australia in 1894, and in Western Australia in 1896. Dr. A. M. Morgan has also, at various times, obtained specimens in different parts of South Australia, as well as nests and eggs. Specimens were kindly lent for examination by the Director of the South Australian Museum, that were obtained at Marion Bay, York Peninsula; the Finke River, Central Australia; and Mildura, Victoria. Also adult males, females, and a young male, collected by Dr. A. M. Morgan, at Laura, about one hundred and forty miles north of Adelaide; and an adult male, procured by Mr. Edwin Ashby at Sandy Point, York Peninsula. From Point Cloates, North-western Australia, Mr. Tom Carter also sent me for identification an adult male.

* Proc. Zool. Soc., 1875, p. 589.

† Proc. Linn. Soc. N.S.W., Vol. ii., p. 53 (1876).

From specimens procured in Western, North-western, and South Australia, Dr. Sharpe has described this species in the "Catalogue of Birds in the British Museum," under Gould's name of *Malurus pulcherrimus*. A nest and eggs in the Macleay Museum, taken in January, 1888, about one hundred miles inland from Derby, North-western Australia, were also described by me under this name.[†] Previously I had never seen the skin of the adult male, which was obtained at the same time with the nest and eggs, but in 1901 I examined it at the Macleay Museum, and found that although labelled *Malurus pulcherrimus* it was not that species but the black-throated bird distinguished by me a few months before under the name of *Malurus assimilis*. Although apparently rare in collections, Mr. George Masters, the Curator of the Macleay Museum, procured a fine series of eleven specimens of the true *Malurus pulcherrimus* of Gould while collecting on behalf of the Trustees of the Australian Museum, at Mongup, Salt River, Western Australia, in January, 1898.[‡] Three of them, beautiful old males, were mounted and have been exhibited in the bird galleries in the main upper hall for the past thirty years.

Of the present species Mr. G. A. Kearland writes me:—" *Malurus assimilis* is one of the most widely dispersed species of the genus, being found in the Wimmera District, Victoria; in the mallee scrub, near Murray Bridge, South Australia; and throughout Central and Western Australia. They are very partial to salt-bush country, and two or three fully plumaged males may be seen hopping about together. Near Owen Springs, in Central Australia, I killed two males of this species and one of *M. callainus* at one shot. They were first observed hopping about a bush within eight feet of where I was riding, and when disturbed by my camel making a noise as I dismounted, simply flew off to the next bush in company with a number of brown and parti-plumaged companions. In Western Australia I first met with this species near Lake Augusta, and afterwards in considerable numbers in the salt-bush and samphire near Adminga Creek, but they were not observed north of Separation Well."

Dr. A. M. Morgan, of Adelaide, has also kindly furnished me with the following notes:—"I met with *Malurus assimilis* in the neighbourhood of Laura, at Port Germein, Port Augusta and Mount Gunson and the neighbourhood. It is almost invariably found in the dry beds of creeks, in pairs or small flocks, generally only one full plumaged male to each flock, presumably an old pair and brood. Two nests were met with. One at Stone Hut, near Laura, on the 19th October, 1895, was built externally of weather-worn grass stems, so as to look at first glance like an old deserted nest; it was domed and lined with feathers, and contained two half-grown young birds. It was placed under a bunch of grasses overhanging the bank of a dry creek. A week later the young birds had left the nest, but were in the vicinity with their parents. Only one pair of old birds were seen in connection with this nest. The other nest, found near Laura on the 13th November, 1895, was placed in the dry sticks of a cut mallee, the young shoots from the stem partially hiding it. It was constructed, like the first, externally of old grass stems and lined with feathers, and contained three fresh eggs. There were several birds about this nest, but only one old male, from which I concluded that it was a second clutch, the more especially as there was an old used nest about ten yards distant, built in a similar manner and situation. Is not the reputation for polygamy which these birds enjoy, according to some writers, due to the fact that the young birds accompany the old pair even after the second clutch is laid? The young birds might all be mistaken for females. The stomachs of three of these birds which I dissected contained nothing recognisable except the remains of ants."

From Point Cloates, North-western Australia, Mr. Tom Carter writes me:—" *Malurus assimilis* is not so numerous here as *M. leucopterus*. It seems to give preference to the low scrub

* Cat. Bds Brit. Mus., Vol. iii., p. 294 (1879).

† Proc. Linn. Soc. N.S.W., 2nd ser., Vol. iii., p. 415 (1888).

‡ Ann. Rep. Austr. Mus. for 1868, p. 7 (1869).

growing in narrow gullies on the rocky ranges; it is also to be met with in 'roley-poley' bushes and other thick undergrowth."

A nest in the collection of the Australian Museum, taken by the late Mr. K. H. Bennett at Mossiel, New South Wales, in October, 1885, is a dome-shaped structure, with a narrow entrance near the top; outwardly it is formed of fine silvery-white dried grasses and their flowering plant-stalks, the inside being slightly lined at the bottom with plant down. Externally it measures five inches in height, by three inches in width, and across the entrance one inch. It was built in a Needle Bush (*Hakea leucoptera*), at a height of five feet from the ground, and contained three eggs. Another nest, taken by Mr. Bennett at Yandembah in October, 1899, is similarly constructed, but was placed in a low bush within a few inches of the ground.

The eggs are three or four in number for a sitting, oval in form, the shell being close-grained, smooth, and lustreless. They are of a dull white ground colour, which is sprinkled over with dots, spots, and blotches of faint pinkish-red, the markings predominating as usual on the thicker end. Length (A) 0.62×0.5 inches; (B) 0.63×0.5 inches; (C) 0.66×0.47 inches. A set taken by Mr. James Ramsay at Tyndarie, New South Wales, measures:—(A) 0.62×0.5 inches; (B) 0.66×0.47 inches; (C) 0.65×0.47 inches. Mr. C. E. Cowle, of Hlamurta, Central Australia, has found the egg of *Lamprolaima basalis* in the nest of *Malurus assimilis*.

This species was found breeding by the late Mr. K. H. Bennett and Mr. J. Ramsay in Western New South Wales in October, also in the same month and November by Dr. A. M. Morgan in South Australia.

Young males resemble the adult female. In their progress towards maturity the under surface becomes almost a uniform dull white; the rich chestnut loreal streak and circle of feathers around the eye is lost; some of the inner scapulars are dull chestnut-red, and the bill is brownish-black. Wing 1.9 inches.

Malurus amabilis.

LOVELY SUPERB WARBLER.

Malurus amabilis, Gould, Proc. Zool. Soc., 1850, p. 277; *id.*, Handbk. Bds. Austr., Vol. I., p. 328 (1865); *id.*, Bds. Austr., fol., Suppl., pl. 21 (1869); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 293 (1879).

Malurus hypoleucus, Gould, Ann. & Mag. Nat. Hist., Ser. 3, Vol. XIX., p. 369 (1867); *id.*, Bds. Austr., fol., Suppl., pl. 22 (1869).

ADULT MALE—Forehead, crown and sides of the head, nape, a line of feathers around the front of the eye, ear-coverts, and a lengthened tuft of plumes extending on to the sides of the neck, light cobalt; a broad collar on the hind-neck, the lower back and rump, rich velvety-black; mantle and upper portion of the back pale carulean-blue; scapulars chestnut-rufous; quills dark brown; the lesser and median upper wing-coverts blackish, the inner greater coverts and inner secondaries dark brown edged with rufous; tail feathers dark blue tipped with white, outer web of the innermost feather white, the white tips decreasing in size towards the central pair; a triangular shaped patch next the blue feathers in front of the eye black; chin, throat, sides of the neck, and upper portion of the breast black; remainder of the under surface white slightly tinged with fawn colour on the thighs; bill black; legs and feet dark fleshy-brown; iris black. Total length 4.8 inches, wing 2, tail 2.4, bill 0.42, tarsus 0.85.

ADULT FEMALE—General colour above dull deep blue; wings brown; the upper wing-coverts slightly tinged with dull blue; tail feathers deep blue tipped with white, outer web of the outermost feather white, the white tips decreasing in size towards the central pair; lores and a circle of feathers around the eye white tinged with fulvous; feathers behind the eye and the ear-coverts cobalt-blue; all

the under surface white slightly washed with fulvous, the latter colour being more distinct on the sides of the body; bill black; legs and feet light fleshy-brown.

Distribution.—Northern Queensland, some of the islands of Torres Strait, North-western Australia.

THE range of this species extends throughout the greater portion of the Cape York Peninsula, and as far south in Queensland as the Herbert River. In a north-westerly direction it is found throughout the southern shores of the Gulf of Carpentaria; and Mr. Bertie L. Jardine informs me that it is found on most of the larger islands of Torres Strait. Mr. C. W. De Vis, M.A., has also recorded it from Cambridge Gulf, North-western Australia.*

A single specimen of this bird was obtained during the stay of H.M.S. "Rattlesnake" at Cape York in 1840, and it was transmitted by the late Captain Owen Stanley to the Zoological Society of London. Gould described it in the following year under the name of *Malurus amabilis*, and later on characterised the female or a young male collected by Mr. J. Jardine in the same locality, as a distinct species under the name of *M. hypoleucus*. The late Mr. James Cockerell, who was collecting with Mr. J. A. Thorpe at Cape York in 1867-8, was the first to inform Gould of his mistake; and this evidence was confirmed by Mr. George Masters, who in writing of the birds collected during the stay of the "Chevert" at Cape York in 1875, remarks:—"*Malurus amabilis*—three males and three females. Mr. Gould described the female of *M. amabilis* as a distinct species under the name of *M. hypoleucus*. I had ample opportunities of observing them at Cape York, and pronounce them as identical without the slightest hesitation."<† Gould's error was a pardonable one, seeing how entirely different the female is in colour from the rule that obtains in the females of the Australian species of this genus. Without seeing these birds in a state of nature, it is a mistake that would have been made by any one who had them placed in his hands for description, and had to judge of their sexes only by the colour of the plumage.

This species is represented in the Australian Museum collection by specimens obtained by Mr. J. A. Thorpe at Cape York in 1867-8; by adults and young birds procured by Mr. Gulliver at Normanton in 1875; by specimens collected by Mr. R. Grant in the low scrub opposite Double Island, near Cairns; and others procured by Mr. Kendal Broadbent in the same neighbourhood. While collecting on behalf of the Queensland Museum in 1888, Mr. Broadbent also obtained specimens on Mount Bellenden Ker, at an altitude of eighteen hundred feet. In a number of adult males now before me, the wing measurement varies from 1.95 to 2.1 inches.

Mr. Bertie L. Jardine has kindly forwarded me a nest of this species, taken by him at Somerset, together with the following notes: "*Malurus amabilis* is a permanent resident of the northern portion of the Cape York Peninsula, and on most of the larger islands of Torres Strait, over which it is tolerably common but nowhere abundantly distributed. In habits it resembles the other members of the genus. It is shy and rarely exposes itself to view; when it does it may be observed in small troops ranging from ten to twenty or more in number, among which is generally only one or two adult males. They traverse the long grass with the utmost activity, and occasionally the fully plumaged male, with tail erect, will perch on a coarse grass-stem or bare twig and pour forth its sweet and animated song. The food of this species consists of various kinds of small insects obtained chiefly on the ground, or behind the sheaths of the long coarse grass in which they are often found. The nest, a dome-shaped structure with an opening in the side, is formed of grasses, and is very often lined with down, feathers, or other soft material. It is artfully concealed near the bottom of a tuft of grass or low brushwood."

* Proc. Roy. Soc. Queensland, Vol. VI., p. 236 (1890).

† Proc. Linn. Soc. N.S.W., Vol. i., p. 52 (1876).

A nest, forwarded by Mr. Jardine, is a dome-shaped structure with a large entrance near the top. It is formed of very fine yellow dried grasses, partially skeletonized leaves, and soft sheaths of grasses, intermingled with a small quantity of spider-webs, and the yellow and white silky covering of the egg-bags of spiders; the upper portion of the nest and the lining inside consists entirely of very fine yellow dried grasses. In shape it resembles the nest of *Malurus lamberti*, the lower portion of the structure being narrower than the top. Externally it measures five inches and a quarter in height by three inches and a half in diameter across the upper part, and two inches and three-quarters across the centre of the lower half; diameter of entrance two inches. It is built between four thin upright twigs of a broad-leaved shrub.

Eggs three in number for a sitting, oval in form, the shell being close-grained, smooth, and slightly lustrous. They are pure white, sparingly sprinkled over with minute freckles and spots varying from pinkish-red to pale purplish-red, the markings predominating as a rule on the thicker end. A set of two, taken by Mr. Bertie L. Jardine, at Somerset, measures:—(A) 0.62×0.48 inches; (B) 0.59×0.48 inches. A set of three, taken near Cooktown, measures:—(A) 0.63×0.48 inches; (B) 0.64×0.5 inches.; (C) 0.6×0.47 inches.

Regarding this species in the Burke District, Northern Queensland, Dr. W. Macgillivray writes me:—" *Malurus amabilis*, is more common in the spinifex ranges south and west of Cloncurry; one nest was taken in a spinifex tuft."

The young male resembles the adult female, the first indication of its sex in plumage showing in some of the scapulars being dull chestnut rufous; the inner secondaries are also faintly margined with rufous. The wing measurement of a young male in the Australian Museum collection in this stage of plumage is 2 inches, and exceeds that of some fully adult males.

The young female is dark brown above, with only a slight wash of deep blue; ear-coverts brown, faintly tinged with cobalt-blue; remainder of the plumage as in the adult, but duller in colour. Wing 1.85 inches.

Malurus elegans.

GRACEFUL SUPERB WARBLER.

Malurus elegans, Gould, Bds. Austr., fol., Vol. III., pl. 22 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 324 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 291 (1879).

ADULT MALE—Forehead, crown, sides of the head and nape pale cobalt blue, passing into light turquoise-blue on the feathers around the eye and the ear-coverts; sides of the neck and hind-neck velvety-black; mantle and upper portion of the back very light cobalt, the bases of the underlying plumes of the latter silvery-white; lower portion of the back and rump velvety-black; scapulars chestnut-red; wings brown, the primaries narrowly edged externally with brownish-white, the inner secondaries edged with rufous; tail feathers dull blue; a triangular-shaped marking in front of the eye black; chin, throat, and upper portion of the breast dark indigo-blue, which is followed by a narrow band of deep black; remainder of the under surface dull white washed with fulvous on the sides of the body and flanks; thighs fulvous-brown; bill black; legs and feet dark reddish-brown; iris blackish-brown. Total length 5.5 inches, wing 2.05, tail 3, bill 0.4, tarsus 0.95.

ADULT FEMALE—General colour above greyish brown, the scapulars and back rusty-brown; wings brown, the primaries narrowly edged externally with brownish-white; tail dull blue; lores and a triangular-shaped spot in front of and extending below the eye rufous; sides of the neck greyish-brown; throat and all the under surface dull white tinged with buff; sides of the abdomen and under tail-coverts fulvous-brown; bill black; legs and feet dark reddish-brown.

Distribution.—Western Australia.

THE Graceful Superb Warbler is an inhabitant of the south-western portion of the continent. Mr. George Masters, while collecting on behalf of the Trustees of the Australian Museum, succeeded in obtaining a series of twenty-three specimens at King George's Sound, Western Australia, in November, 1868. Mr. Masters informs me that he found it very common in the scrub near the coast, and that he had no difficulty in procuring as many specimens as he required. It was not met with far inland.

The adult male of *Malurus elegans* belongs to that section of the genus which has the shoulders chestnut-red and the throat dark blue. From all species it may be distinguished by the very light cobalt feathers of the mantle and upper portion of the back. On lifting these feathers it will be found that the underlying plumes are silvery-white; those adjoining the upper back are velvety-black, but have also white bases.

Of this species Gould writes :—"The nest is dome-shaped, with a hole in the side for an entrance, and is generally formed of the thin paper-like bark of the Tea-tree (*Melaleuca*), and lined with feathers: it is usually suspended to the foliage of this tree, and occasionally to that of other shrubs which grow in its favourite localities. The eggs are four in number, of a delicate flesh-white, freckled with spots of reddish-brown, which are much thicker at the larger end: they are about eight lines long and six lines broad. The breeding season commences in September, and continues during the three following months."

Young males resemble the adult female. In their approach to maturity they may be found in all stages of the intermingled plumage common to both sexes, until they finally attain their full adult livery.

Malurus pulcherrimus.

BLUE-BREASTED SUPERB WARBLER

Malurus pulcherrimus, Gould, Proc. Zool. Soc., 1844, p. 106; *id.* Bds. Austr., fol., Vol. III, pl. 23 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 326 (1865); North, Viet. Nat., Vol. XVII, p. 30 (1901).

ADULT MALE—*Forehead, crown, and sides of the head purplish-blue, passing into a rich cobalt on the feathers around the eye and the ear-coverts; sides of the neck and collar on the hind-neck velvety-black; mantle and upper portion of the back purplish-blue; lower portion of the back and rump velvety-black; scapulars chestnut-red; wings brown, the primaries narrowly edged externally with brownish-white, the inner secondaries edged with rufous; tail dull blue, all but the two central feathers tipped with white; a triangular shaped mark in front of the eye black; chin, throat, and upper portion of the breast indigo-blue, which is followed by a narrow band of deep black; remainder of the under surface dull white, washed with fulvous on the sides of the body and flanks; bill black; legs and feet black; iris blackish-brown. Total length 5 inches, wing 1.9, tail 2.7, bill 0.4, tarsus 0.9.*

ADULT FEMALE—*General colour above brown; upper wing-coverts and quills brown, the primaries narrowly edged externally with brownish-white; tail feathers dull blue; lores and a narrow circle of feathers around the eye chestnut; throat, sides of the neck, and all the under surface fulvous-brown, paler on the throat and centre of the abdomen, darker on the sides of the body; bill reddish-brown; feet fleshy-brown.*

Distribution.—Western Australia.

THE adult males of the present species and of *Malurus elegans* may at once be distinguished from their chestnut-shouldered allies, *M. lamberti*, *M. assimilis*, and *M. amabilis*, in having the throat deep blue instead of black. Otherwise *M. assimilis* closely resembles *M. pulcherrimus*, and for which it has been frequently mistaken.

* Handbk. Bds. Austr., Vol. i., p. 325 (1865).

So far as I am aware, the Blue-breasted Superb Warbler is strictly confined to the south-western portions of Western Australia. In January, 1868, Mr. George Masters, while collecting on behalf of the Trustees of the Australian Museum, succeeded in obtaining eleven specimens near Mongup, Salt River. Mr. Masters informs me that it is an inland and by no means common species, remarkably shy, and that he has never observed it within less than sixty miles of the coast. Those he procured were frequenting the margins of belts of "marloch" trees, which grow in patches or belts resembling mallee scrubs, and vary from five to ten feet in height.

"For a knowledge of this species," Gould writes, "I am indebted to the researches of Gilbert, who informs me that it appears to be exclusively confined to the thickets of the interior of Western Australia: in habits and manners it greatly resembles the other members of the genus, but its nest is somewhat smaller than either any of them. A nest found on the 28th October, in the vicinity of the Wongan Hills, was placed on the upper branches of a species of *Hakea*, about four feet from the ground: it contained two newly-laid eggs, which resembled those of the other species of the genus, but had the blotches very much larger."

Young males in change of plumage resemble the adult male, but have some of the feathers on the crown of the head, hind-neck, and mantle brown, and some dull white feathers intermingled with the dark indigo-blue feathers on the chin and throat.

Malurus melanocephalus.

SCARLET-BACKED SUPERB WARBLER.

Muscicapa melanocephala, Lath., Ind. Orn., p. lii., (1801), imm. male.

Sylvia dorsalis, Lewin, Bds. New Holl., pl. XIV., (*teste* Sharpe).

Scarlet-back Warbler, Lewin, Bds. N.S.W., pl. XIV., p. 14 (1822).

Malurus melanocephalus, Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 222 (1826); Gould, Bds.

Austr., fol., Vol. III., pl. 26 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 333 (1865);

Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 296 (1879).

ADULT MALE—*Head and neck velvety-black; mantle, scapulars, back, and rump orange-scarlet; upper wing-coverts black; quills brown externally edged with pale brown; upper tail-coverts black; tail black; all the under surface velvety-black; bill black; legs and feet fleshy-brown; iris black. Total length in the flesh 4.5 inches, wing 1.75, tail 2, bill 0.37, tarsus 0.72.*

ADULT FEMALE—*General colour above brown, tinged with fulvous on the back and rump; upper wing-coverts like the back, the greater series mesially streaked with dark brown; quills dark brown, the primaries externally edged and the secondaries margined with fulvous-brown; tail feathers brown edged with fulvous-brown; sides of the head and neck brown; all the under surface dull white; sides of the body and abdomen pale fulvous-brown; upper mandible brown, lower mandible fleshy-brown; legs pale fleshy-brown, feet slightly darker; iris dark brown. Total length in the flesh 4.75 inches, wing 1.8, tail 2.3, bill 0.42, tarsus 0.72.*

Distribution.—Queensland, North-eastern New South Wales.

THE range of this species extends from the neighbourhood of Cairns, in North-eastern Queensland, as far south (according to Lewin) as the Paterson River, an affluent of the Hunter River in New South Wales. It is principally an inhabitant of the coastal districts and contiguous mountain ranges, and is not found in the dry western portion of these States.

In describing *Malurus melanocephalus* in the "Transactions of the Linnean Society," Messrs. Vigors and Horsfield refer it to the *Muscicapa melanocephala* of Latham. This species is founded on the Orange-rumped Flycatcher in Latham's "General Synopsis of Birds," which description

* Handbk. Bds. Austr., Vol. i., p. 326 (1865).

accurately agrees, even to the old and abraded brown tail feathers, with one of the stages of plumage of the immature male.

As already pointed out by Dr. Ramsay, the *Sylvia dorsalis* of Lewin¹ is undoubtedly the *Malurus melanocephalus* as figured by Gould, and certainly not the *M. cruentatus* of Gould. The type of the latter species was obtained in North-western Australia, and the bird figured by Lewin, it is stated "inhabits the forests near the banks of the Paterson River." This locality is the farthest south in New South Wales that the Scarlet-backed Superb Warbler has been recorded. Moreover Lewin refers to his work, published in 1808, as the "Birds of New South Wales,"² and not as the "Birds of New Holland," a title it received in London where the letter-press was printed. All the species figured are well known in New South Wales, and, with the exception of five are common in the neighbourhood of Sydney at the present day. Probably Lewin obtained the specimens from which his description and figures of the "Scarlet back Warbler"³ were taken, when he accompanied Colonel Paterson, the Lieutenant-Governor of the then recently formed colony of New South Wales, in his exploration of the Hunter River in the barque "Lady Nelson" in June and July, 1801. All the copies I have seen of Lewin's works referring to the Australian avifauna give the vernacular names of the species only. The name, *Sylvia dorsalis*, Lewin, in the preceding synonymy, is given upon the authority of Dr. Sharpe, who quotes it for the northern and north-western species *Malurus cruentatus*, and doubtless occurs in the 1808 edition. It is remarkable, however, that in the 1822 and 1838 re-issues of Lewin's work, the scientific name of each species should have been omitted.

I have a series of twenty adult males now before me, including specimens procured from as far north as Cairns, Queensland, to the Macleay River in New South Wales. Adult males from the Herbert River, Cardwell, and Cairns, Queensland, are slightly deeper in colour than examples obtained in New South Wales. As pointed out by Gould, the brown tail feathers of the young males are longer than when the bird attains the fully adult plumage, when they are black. I have a young male now before me with the central tail feathers measuring 2.4 inches.

During a visit to the Clarence River District in 1808, I met with this species in pairs frequenting the low undergrowth and long grass. In habits it resembles *Malurus lamberti*, but the scarlet back of the adult male renders it more conspicuous than that species, if not of the genus. A nest just ready for the reception of eggs was found by my companion on the 7th November, also another nest containing three young birds that had recently emerged from the shell. In the former instance the nest was built in some long grass, near a log lying on the ground, and close to some thick scrub, its whereabouts being betrayed by the birds. On visiting it a week afterwards, I found that the nest and its surroundings had been consumed by a bush fire. The other one, containing three young, was built in some "blady grass" near a creek in a cleared paddock. This nest, which is represented on Plate A. V., I photographed under some difficulties two days later, in a moisture-laden atmosphere, with the thermometer standing at 104° in the shade. Visiting this nest on the 17th November, I found the young fully feathered, and crowded together at the entrance of the nest, which was much enlarged. In colour they resembled the female. On hearing the warning cries of the parents, they scrambled out of the nest and concealed themselves in the surrounding grass.

The stomachs of a number of these birds I have examined contained the remains of various kinds of insects, and principally the heads, legs, and wing-cases of small beetles.

* Proc. Linn. Soc. N.S.W., 2nd ser., Vol. i, p. 1089 (1886).

† Bds. New Holl., pl. xiv.

‡ *Sydney Gaz.*, Nov. 20th, 1808.

§ Bds. N.S.W., pl. xiv., p. 14 (1822).

Handbk. Bds. Austr., Vol. i, p. 334 (1865).

Mr. George Savidge kindly forwarded an interesting series of these birds in the flesh to the Australian Museum on the 1st August, 1901, which were shot by him the same day at Copmanhurst. One is a fine old adult male in full plumage. Another, an immature male, resembles the adult female, except in having the bill dull black and about half the feathers on the back dull orange-scarlet instead of fulvous-brown. Five are in the plumage of the adult female, and moreover resemble that sex precisely in the colour of the bill, legs, and feet. The sex of one of them, however, is indicated by a single new jet black tail feather measuring 0·8 inches in length, and of which only 0·3 inches has burst its sheath. Concealed under the brown feathers of the back are six orange-scarlet feathers enclosed in sheaths, except at the tips, those on the lower back being slightly more advanced towards maturity. Dissection proved another to be a young male, and the remainder adult females.

With the above specimens, Mr. Savidge sent me the following note:—“*Malurus melanocephalus* is, as you know, plentifully dispersed about the Upper Clarence District, and frequents chiefly patches of blady-grass, swampy country, and the borders of creeks. I cannot think with Gould that the adult males assume their full red and black livery only during the breeding season. Fully plumaged males are just as plentiful now as at any other season of the year. Young males are evidently brown, but you will notice one of the specimens, or even two, have commenced to assume the distinguishing plumage of the male. These birds usually quickly conceal themselves when any danger is about, and wounded ones are very difficult to find, as they hide away in the least cover. The breeding season begins here in August, and continues until the end of February.”

The nest is oval in form, with a rounded entrance near the top, and is constructed outwardly of dried grasses, lined inside with fine grasses or plant down. Some nests have a few thin strips of bark worked into the outer portion; others, as the one figured on Plate A. V., a few thin dead leaves and skeletons of leaves. An average nest measures externally four inches and a half in height by three inches and a quarter in diameter, and across the entrance one inch and a quarter. It is usually built in long coarse grass, and frequently in blady-grass in the north-eastern portion of New South Wales.

The eggs are three or four in number for a sitting, and vary considerably in the disposition of their markings. Typically they are oval in form, although elongate and rounded ovals are not uncommon, the shell being close-grained and its surface smooth and slightly lustrous. In a number of sets now before me, the ground colour in all is pure white, and the markings vary from a few almost invisible dots of pinkish-red to well defined but irregular shaped spots and blotches of reddish-brown, which predominates as usual on the thicker end, where a zone or cap is sometimes formed. A set of three, taken at Ripple Creek, Herbert River, Queensland, by Mr. J. A. Boyd on the 16th September, 1894, measures as follows:—Length (A) 0·61 × 0·45 inches; (B) 0·62 × 0·46 inches; (C) 0·62 × 0·46 inches. A set of four, taken by Mr. G. Savidge at Copmanhurst, in November, 1900, measures:—(A) 0·62 × 0·47 inches; (B) 0·64 × 0·47 inches; (C) 0·61 × 0·47 inches; (D) 0·65 × 0·49 inches.

Young males resemble the female in colour and size, and have the brown tail feathers longer than when fully adult. In their approach to maturity the orange-scarlet feathers on the back are, as a rule, the first indication of the distinguishing sexual colour. Still older birds have some of the feathers on the head and centre of the breast black, the new and shorter tail feathers are also black, and the remainder brown; bill brown. Wing 1·7 inches. Gradually the fully adult plumage is assumed, until the last trace of immaturity is lost when the brown feathers on the thighs are replaced by black ones.

August and the six following months constitute the usual breeding season of this species in north-eastern New South Wales, but I have received from the Dawson River District, Queensland, two full sets taken respectively on the 12th and 17th March, 1893.

Malurus cruentatus.

CRIMSON-BACKED SUPERB WARBLER

Malurus cruentatus, Gould, Proc. Zool. Soc., 1839, p. 143; *id.*, Handbk. Bds. Austr., Vol. I., p. 334 (1865).

Malurus brevii, Gould, Bds. Austr., fol., Vol. III., pl. 27 (1848).

Malurus dorsalis, (nec SYLVIA DORSALIS, Lewin), Sharpe, Cat. Bds. Brit. Mus., Vol. IV., p. 296 (1879).

Malurus cruentatus boweri, Ramsay, Proc. Linn. Soc. N.S.W., 2nd ser., Vol. I., p. 1100 (1886).

ADULT MALE—*Head and neck velvety-black, mantle, scapulars, back, and rump deep crimson; upper wing-coverts and the innermost secondaries black, quills brown, the primaries externally edged with paler brown, upper tail-coverts and tail feathers black; all the under surface velvety-black; bill black; legs and feet fleshy brown; iris black. Total length 4.7 inches, wing 1.95, tail 1.75, bill 0.5, tarsus 0.72.*

ADULT FEMALE—*General colour above fulvous brown, upper wing-coverts like the back; quills brown, externally margined with fulvous brown, tail feathers brown, margined with fulvous-brown; feathers around the eye and sides of the neck fulvous, all the under surface dull white, tinged with fulvous on the lower neck; sides of the body and under tail-coverts fulvous. Total length 4.4 inches, wing 1.95, tail 2.4, bill 0.5, tarsus 0.72.*

Distribution.—North-western Australia, Northern Territory of South Australia, Northern Queensland.

THE present species, described by Gould in 1839, was one of the novelties obtained by the Officers of H.M.S. "Beagle," in North-western Australia. In his folio edition of the "Birds of Australia," Gould figures it under the name of *Malurus brevii*, the latter species being described by Vigors and Horsfield from a specimen procured by Mr. Brown in September 1802, near the inner entrance of Thirsty Sound, on the eastern coast of Queensland. In his "Handbook," Gould restores his name of *M. cruentatus* for the north-western and northern species, and places *M. brevii* as a synonym of *M. melancephalus*. Undoubtedly Gould was correct in the latter view, for adult males from the neighbourhood of Thirsty Sound are but slightly deeper in tint than typical examples of *M. melancephalus*, obtained in New South Wales. Dr. Sharpe states "that the type of *M. brevii* scarcely equals in intensity the blood-red or crimson colouring of the Port Essington and N.W. Australian birds; and it seems that there may be possibly three species of red-backed *M. cr.*, differing only in the intensity of the colouring of the back." I do not agree with there being three species, for when a large series of these birds from different parts of the continent are examined, it will be found that *M. melancephalus*, Lath., and *M. cruentatus*, Gould, intergrade one with the other. Even at Cairns, which is very much further north than Thirsty Sound, the common species is the darker coloured race of *M. melancephalus*, with the unmistakeable orange tint in the feathers of the back. Of fifteen adult males now before me from that neighbourhood, collected by Messrs. Cairn and Grant, thirteen belong to this race and only two approach in colour the *M. cruentatus* of Gould.

My descriptions have been taken from examples obtained at Derby, North-western Australia. Adult females from this part of the continent may be distinguished by the stronger fulvous wash on the upper and under surface. In specimens from the Northern Territory and Port Essington this shade is more apparent on the upper tail-coverts. Specimens of *Malurus cruentatus* in the Australian Museum collection, were obtained by Mr. E. J. Cairn, the late Mr. T. H. Bowyer-Bower and Mr. G. A. Keartland, in the neighbourhood of Derby, North-western Australia; by Mr. A. Morton at Port Essington; by Mr. Kendal Broadbent and Mr. Gulliver at the Gulf of Carpentaria; and by Mr. J. A. Thorpe at Cape York. The adult male obtained by Mr. Gulliver

* Cat. Bds. Brit. Mus., Vol. iv., p. 297 (1879).

is in the moult, and is of a different shade of crimson to any other specimen I have seen. There are skins also in the Macleay Museum, obtained by the late Mr. E. Spalding at Port Darwin, and Mr. George Masters at Cape York in 1875. *Malurus cruentatus bowyeri*, Ramsay, the type of which I have now before me, I regard only as an abnormally plumaged young male of *M. cruentatus*. It formed one of a large series of *M. cruentatus* collected by the late Mr. T. H. Bowyer-Bower near Derby, North-western Australia.

Mr. G. A. Kearland writes me:—"*Malurus cruentatus* is very common in the neighbourhood of the Fitzroy and Margaret Rivers in North-western Australia. During November and December, 1896, I observed them in the open forest frequenting the tallest trees. When driven from one tree to another, they preferred the elevated branches of the *Eucalypti* to the dense low bushes which they passed in their flight, and one was shot from a branch fifty-feet high. As soon as the rain fell they altered their habits, and were found in the long grass and low bushes. Possibly the intense heat of the dry ground had previously caused them to seek the cooler atmosphere of a higher elevation. Many of their nests were found in *Bauhinia* trees and in the native "peach-bushes," usually about four feet from the ground, although some were placed as high as ten feet. The birds were far from shy, and no difficulty was experienced in obtaining specimens."

A nest of this species, taken by Mr. Kearland from a low bush, is a dome-shaped structure with an entrance near the top. It is rather loosely put together, and is formed throughout of very fine dried grasses and strips of white bark, intermingled with the coverings of some composite plant. Externally it measures four inches and a half in height by two inches and a half in diameter, and across the entrance one inch.

In the nests examined the eggs were three or four in number for a sitting. They are oval or rounded-oval in form, the shell being close-grained, and its surface smooth and lustreless. The ground colour, which is pure white, is finely dusted, freckled, or blotched with pinkish or brownish-red, the markings on some specimens being clear and well defined, in others nearly obsolete. Like those of *M. melanocephalus*, some are sparingly but evenly blotched over the entire surface of the shell, but as a rule the markings predominate on the thicker end, where in some instances they form a well defined zone. A set of three, taken by Mr. G. A. Kearland in January, 1897, near the junction of the Fitzroy and Margaret Rivers, in North-western Australia, measures as follows:—Length (A) 0.6×0.5 inches; (B) 0.62×0.44 inches; (C) 0.6×0.44 inches. Another set, taken in the same locality measures:—(A) 0.61×0.43 inches; (B) 0.59×0.42 inches; (C) 0.58×0.44 inches; (D) 0.6×0.41 inches.

In concluding the *Maluri*, I regret that I am unable to give a description of the nest and eggs of the Crowned Superb Warbler (*Malurus coronatus*, Gould), one of the most beautiful species of the genus. There are in the Reference Collection specimens of these birds which were obtained by Mr. E. J. Cairn, about one hundred miles inland from Derby, North-western Australia, in 1886, who also procured the nest and eggs. Unfortunately only portion of his collection was received at the Australian Museum; two boxes, containing many specimens and including among others the nest and eggs of *Malurus coronatus*, were lost in transit.

Family TURDIDÆ.

Sub-Family TURDINÆ.

Genus GEOCICHLA, Kuhl.

Geocichla lunulata.

MOUNTAIN THRUSH.

Turdus lunulatus, Lath., Ind. Orn., Suppl., p. xlii, (1801).

Oreocichla macrorhyncha, Gould, Proc. Zool. Soc., 1837, p. 115.

Oreocichla lunulata, Gould, Bds. Austr., fol., Vol. IV, pl. 7 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 439 (1865).

Geocichla lunulata, Seebold, Cat. Bds. Brit. Mus., Vol. V., p. 155 (1881).

Geocichla macrorhyncha, Seebold, Cat. Bds. Brit. Mus., Vol. V., p. 156 (1881).

ADULT MALE.—General colour above olive-brown, each feather having a crescent-shaped black mark at the tip, followed by a pale twony subterminal band on the feathers of the head and hind-neck, those of the lower back and rump having paler shaft streaks; upper wing-coverts dark brown, broadly margined on their outer webs with olive-brown, and tipped with twony white; quills brown, the secondaries broadly margined with olive-brown on their outer webs, the primaries more narrowly edged externally with a warmer shade of olive-brown; tail feathers olive-brown, the lateral feathers narrowly tipped with white; lores dull whitish; feathers on the sides of the neck white, slightly tinged with ochraceous and tipped with black; from the base of the lower mandible extends a more or less well defined black cheek stripe; chin and throat white, some of the feathers on the lower throat having small blackish-brown spots at the tip; remainder of the under surface white, tinged with ochraceous on the fore-neck and upper portion of the breast, and most of the feathers having a crescent shaped black marking at the tip; basal portion of the feathers on the sides of the upper breast olive-brown; centre of the abdomen white; under tail-coverts white, a few of the longer feathers having a spot of blackish-brown at the tip; bill dark brown, base of lower mandible yellowish-brown; legs and feet pale fleshy-brown; iris blackish-brown. Total length in the flesh 11.5 inches, wing 5.5, tail 4.55, bill 1.65, tarsus 1.35.

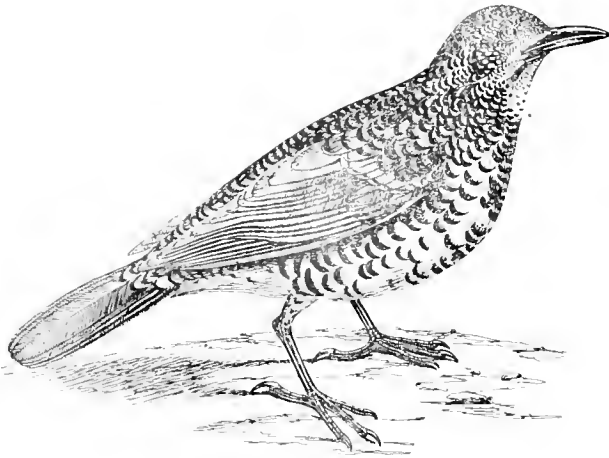
ADULT FEMALE.—Similar in plumage to the male.

Distribution.—New South Wales, Victoria, South Australia, Tasmania, and some of the islands of Bass Strait.

AN examination of a large series of the true Thrushes inhabiting Australia and Tasmania, has induced me to follow Gould in uniting his *Geocichla macrorhyncha* with the present species. The former species was described by Gould in the "Proceedings of the Zoological Society," in 1837, prior to his visit to Australia, the habitat being there stated as New Zealand. In his "Synopsis of the Birds of Australia," it is given as New Zealand or Van Diemen's Land. Subsequently, in his folio edition of the "Birds of Australia," also in his "Handbook," after his visits to Tasmania and Australia, where in both places he saw these birds in their favourite resorts, he relegated his specific name of *macrorhyncha* to a synonym of Latham's older name *lunulata*. Tasmanian examples are slightly darker than typical Australian birds, but I have specimens now before me, collected at Cambewarra, in the Illawarra District of New South Wales, that are perfectly indistinguishable in any way from others collected in Tasmania by Mr. Kendal Broadbent. I find in Australian specimens that the size and depth of colour of the black crescentic body markings and the extent of the white tips to the lateral tail-feathers are extremely variable, and so are the birds in size, even from the same locality. As a rule the two outermost tail feathers are tipped with white, but two examples from Cambewarra, apparently very old birds by their size and depth of colour, have only the outermost tail feather

tipped with white. Of two adult males from Tasmania, one has the outermost tail feather only tipped with white, and the other the two outermost feathers. The wing measurements of these two birds vary from 5.2 to 5.5 inches, and their bills from 0.95 to 0.98 inches, and agree in size with others obtained at Cambewarra, New South Wales. By taking a Tasmanian bird and comparing with it the extreme type, or a lighter coloured bird from South-eastern Australia, one could easily recognise two species, but on examining a large series of continental examples, it will be found that they are extremely variable in size and colour, and that both races are found in Australia.

The range of the Mountain Thrush extends throughout Eastern New South Wales, Victoria, the south-eastern portion of South Australia, some of the larger Islands of Bass Strait, and nearly the whole of Tasmania. I first met with this species in Victoria, in the tea-tree scrubs between Cheltenham and Frankston, and also near Oakleigh, breeding in the early winter months. Before the undergrowth was cleared at Childers in the Strzelecki Ranges, it was unusually plentiful in August, and was sometimes seen congregated in small



MOUNTAIN THRUSH.

flocks, and from this habit it was first pointed out to me as a "Scrub Quail." As in Gould's time it still frequents the neighbourhood of Sydney, and may be occasionally met with in the swampy undergrowth between Manly and Newport. I have observed it, too, at Roseville, and throughout the south coastal districts and contiguous mountain ranges, and inland on the western slopes of the Blue Mountains. Dr. A. M. Morgan and Mr. A. Zietz both write me that it is very rare in South Australia, although it occurs in the hills near

Adelaide. One specimen was shot at Mount Barker; and another, forwarded to me for examination by the Trustees of the South Australian Museum, Mr. Zietz informs me, was killed through flying against a wire fence.

Although it frequents alike the scrubs and flats near the coast, as well as the humid ranges inland, I have retained Gould's vernacular name of "Mountain Thrush," a literal translation of his generic name *Oreocichla*, in order to distinguish these birds from the members of the genus *Cinclosoma*, which he has termed Ground Thrushes, although the latter are in no way related to the sub-family *Turdine*.

The food of the Mountain Thrush is procured on the ground among fallen leaves, débris, and moss-covered logs, and consists principally of insects of various kinds, worms, land crustaceans, and molluscs.

The only notes I have heard this species utter, which were subdued but nevertheless shrill, resembled the noise produced by the revolutions of an engineer's ratchet-drill while boring a metal plate.

The nest is a round open cup-shaped structure, and is usually formed of fine strips of bark, lined inside with dried grasses or wiry rootlets, the whole exterior and rim, which is thick rounded, being coated with green moss. Others I have seen constructed outwardly entirely of tea-tree bark and dead leaves, and the exposed portion of two nests decorated with pieces of pale green and white lichen, like some nests of *Eopsaltria australis*. The nests, too, vary in size,

for they are resorted and added to season after season. The materials forming the lower portion of the original nests, owing to excreta, rains, and storms, become decomposed and consist chiefly of mould and decayed vegetable matter. This is more apparent when attempting to remove one of these long-resorted to structures from a thick forked branch. An average nest of the year measures externally seven inches and a half in diameter by four inches in depth; the inner cup three inches and a half in diameter by two inches and a quarter in depth; rim two inches. The position of the nest varies with the localities in which it is found. The favourite site near the coast is in a fork near the top of a tea-tree; and on the mountain ranges, wedged between the thick forked trunk of a smooth barked gum-tree, or on a moss-covered horizontal branch of any tree growing in a secluded gully. At Oakleigh, near Melbourne, I have also found it in the thick fork of a gum tree and close to a tea-tree bordered creek. When built in the latter position two sides of the nest alone are visible, that portion of it placed between the fork consisting only of a lining and a narrow rim. Generally the nest is built from ten to fifteen feet from the ground, not infrequently within hand's reach, and occasionally as high as twenty feet.

The eggs are two or three in number for a sitting, varying from oval to elongate-oval in form, the latter being the more common type; the shell is close grained, smooth, and glossy. In ground colour they vary from a dull bluish-green, or greenish-grey, to a pale sand-stone colour, which in typical specimens is thickly and minutely freckled or mottled over the entire surface of the shell with different shades of dull reddish, pinkish, or chestnut-brown. In some specimens the markings predominate or are entirely confined to the larger end; in others they are so thickly disposed that the ground colour is almost obscured, giving the egg a reddish-brown hue. Of rare varieties are those of a light clay and stone-grey ground colour, which is irregularly and heavily blotched and spotted on the larger end with different shades of reddish or dull purplish-brown. A set of two, taken at Cheltenham, Victoria, measures: Length (A) 1.41×0.92 inches; (B) 1.4×0.91 inches. Another set, taken at Bayswater by Mr. J. Gabriel on the 20th September, 1895, measures: (A) 1.37×0.93 inches; (B) 1.35×0.93 inches. A set taken at Circular Head, Tasmania, in 1887, measures: (A) 1.37×0.97 inches; (B) 1.38×0.95 inches. A small egg, taken in the same locality on the 4th October, 1887, measures 1.29×0.9 inches.

Relative to the breeding of this species in Tasmania, the following information is extracted from Dr. Holden's MS. notes, made while resident at Circular Head, on the north-western coast:—"On the 16th October, 1886, I found a nest of the Mountain Thrush, containing two young ones just hatched. It was a large structure composed outwardly and almost entirely of green moss with a little dry grass and bark, the inside being neatly lined with fine dry grass. The nest, on which the bird was sitting, was about ten feet up a tree-trunk, supported by the broken remains of a dead branch. On the 9th November following I found another nest containing two young just hatched. The mother sat very close and almost allowed me to touch her before she would move. The nest was formed of tea-tree debris and dirt, and lined with dry grass. It had no moss about it, and was built in the fork of a tea-tree growing in a swamp, the height of the structure being about seven or eight feet from the water. Not far off I found a nest in the topmost twigs of a small tea-tree. It had been half overturned, perhaps by the wind, but contained an addled egg; another broken egg was lying on the ground beneath the nest. On the 14th November I found a nest well up on an old stump, containing one chick just hatched. Another, with a broken egg in it, was built in an old opossum's nest high up in a tea-tree. Two days later I found a nest containing two much incubated eggs, built in an old opossum's nest, in the top of a sapling; also a nest in the fork of a tea-tree, with an addled egg and half shell of another. The Mountain Thrush is usually seen on the ground, and allows a close approach if one remains pretty quiet. I have never heard them utter any note."

There are eggs in the Australian Museum collection taken by Dr. Ramsay at Dohobyde, from a nest built in a tea-tree, in July, 1860. The nest and eggs of this species were among the first I obtained in my early collecting days. In the tea-tree scrub near the beach between Cheltenham and Frankston, in Victoria, we used to find many nests containing eggs, some as early as the middle of July, but more plentiful in August, and on until the end of September. In South Gippsland the usual breeding season did not commence until September, and it continued until the middle of January. On the 16th September, 1893, at Sassafras Gully, near Springwood, New South Wales, in company with the Hon. Dr. J. Norton, M.L.C., we saw boys engaged in blowing two eggs of this species that they had just taken from a nest in a tree on the creek side. These eggs were fresh, and well marked specimens. On the 14th October following, at Springwood, Dr. Norton took two partially incubated eggs from a nest built in the thick fork of a gum-tree at a height of twenty feet from the ground.

Mr. Joseph Gabriel sent me a set of two eggs, taken by him at Bayswater, Victoria, on the 22nd December, 1896; and later on, under date 30th October, 1898, supplied me with the following interesting notes:—"At Mordialloc and the surrounding low-lying districts, the laying season of *Geocichla lunulata* is July to September. The nests are usually placed in the forks of tea-trees (*Melaleuca*), and frequently old nests are re-lined, covered with moss, and used a second time. In these districts three eggs invariably form a set. On the Dandenong Ranges these birds have different habits. They are rather shy and build their nests on Musk-trees (*Aster argophylla*), but more frequently on heads and side projections of Ferns (*Cyathea dealbata*). There they never lay more than two eggs for a set, and their nesting-time is from September to January. Two sets of eggs were taken on the 29th November, 1896, one set on the 22nd December following, and one set on 19th October, 1898. Immediately below the hills, on the flats, my friends found a nest with three young. It is strange that the breeding time should be so widely different on hill and flat, also the different number of eggs found in the two situations. I thought at first that exceptionally dry seasons was the primary cause, but you will see that I have taken (from the top of a fern) a few days since a set of two eggs which were perfectly fresh, and we have had a fair amount of rainy weather this season."

From the preceding remarks, and those quoted from Mr. Gabriel, it may be gathered that the usual breeding season of the Mountain Thrush in south-eastern Australia, near the coast, is from the beginning of July until the end of October, and on the mountain ranges from September until the end of January or middle of February. Owing probably to the more southerly position of Tasmania, the breeding season there, even near the coast, is much later than on the continent.

Young birds are duller in colour than the adults, and have the black crescentic tips to the feathers of the upper and under surface much smaller; all the tail feathers are more or less tipped with white, increasing in extent on the outermost feather where it extends into a wedge-shaped marking close to the shaft on the inner web. These white tips decrease in number and size until they remain only on the outermost feathers.

Geocichla heinii.

HEINE'S MOUNTAIN THRUSH.

Oreocincla heinei, Cabanis, Mus. Hein., Theil I., p. 6 (1850).

Geocichla heinii, Seebohm, Cat. Bds. Brit. Mus., Vol. V., p. 157 (1881).

ADULT MALE—*Like the adult male of GEOCICHLA LUNULATA, but having the general olive-brown colour of the upper parts washed with rufescent-ochraceous, which is more pronounced on the lower back, rump, and upper tail-coverts; the outer series of the median and greater wing-coverts have*

ochraceous tips, and the apical half of the inner web of the outermost feather is white. Total length 9 inches, wing 4·7, tail 3·5, bill 0·98, tarsus 1·12.

ADULT FEMALE—Similar in plumage to the adult male.

Distribution. Eastern Queensland, North-eastern New South Wales.

THIS species, or smaller northern race of *Georchila lunulata*, was described by Dr. Cabanis in his "Museum Heineanum," but the habitat is there erroneously recorded as Japan. In the "Catalogue of Birds in the British Museum," the late Mr. H. Seebohm states it "appears to be found throughout Eastern Australia as far south as Moreton Bay." In Dr. Ramsay's "List of Birds met with in North-eastern Queensland,"* the species there referred to by him under the name of *Oreocanda lunulata*, is I think, referable to *Georchila heinii*.

The preceding description is taken from a specimen procured near Port Mackay at the mouth of the Pioneer River, Queensland. Examples obtained at Ballina and Lismore, New South Wales, are slightly larger, less distinctly washed with rufescent-ochraceous on the upper parts, the ochraceous tips to the median and greater wing-coverts are much smaller and paler, and the white tips to the inner web of the outermost tail feather are smaller, and in some specimens are tinged with rufescent-brown. Wing 4·75 to 4·9 inches. Of six specimens since received, collected by Mr. James Yardley further north at Dungay Creek, Tweed River, near the Queensland border, three appear to belong to the smaller form, *Georchila heinii*; the others are indistinguishable from typical specimens of *G. lunulata* obtained in the southern portion of New South Wales. Mr. Yardley informed me that they were all shot in company with one another, and that the difference in size and colour he believed was only a sexual one.

A nest of this species, taken near the Tweed River in October, 1891, is a round open cup-shaped structure, formed externally of thin strips of bark, plant tendrils, and *Casuarina* leaves, and is thickly coated with green moss, the inside being lined with wiry black rootlets. It measures outwardly six inches in diameter by three inches and a half in depth, and the inner cup three inches in diameter by two inches and a quarter in depth.

The eggs are usually two in number for a sitting, oval in form, the shell being close-grained, and its surface smooth and lustreless. They are of a pale green or greenish-blue ground colour, which is minutely and faintly freckled with pale chestnut-red, the markings predominating on the thicker end, where a small cap is sometimes formed. A set of two in Mr. George Savidge's collection, taken in the Richmond River District on the 12th September, 1901, measures: Length (A) 1·15 × 0·9 inches; (B) 1·19 × 0·9 inches.

Family SYLVIIDÆ.

Genus ACROCEPHALUS, *Naumann*.

Acrocephalus australis.

REED WARBLER.

Acrocephalus australis, Gould, Bds. Austr., fol., Vol. III., pl. 37 (1848); Seebohm, Cat. Bds. Brit. Mus., Vol. V., p. 100 (1881).

Calamoherpe australis, Gould, Handbk. Bds. Austr., Vol. I., p. 402 (1865).

ADULT MALE—General colour above brown slightly tinged with olive, passing into a dull fawn colour on the rump and upper tail-coverts; upper wing-coverts like the back; quills brown, externally edged with pale olive-brown; a stripe extending from the nostril over the eye dull whitish; ear-

* Mus. Hein., Theil i., p. 6 (1850).

† Proc. Zool. Soc., 1875, p. 591.

coverts olive-brown; all the under surface dull white tinged with buff, sides of the body light fawn colour, becoming darker on the sides of the abdomen; under tail-coverts white, slightly tinged with fawn colour; thighs fawn-brown; bill dark brown, the under mandible pale fleshy-brown except at the tip; legs and feet dark olive-grey. Total length in the flesh 6.2 inches, wing 2.85, tail 2.45, bill 0.55, tarsus 0.97.

ADULT FEMALE.—Similar in plumage to the male.

Distribution.—Queensland, New South Wales, Victoria, South Australia, Tasmania.

THE range of the Reed-Warbler extends throughout south-eastern Queensland, eastern New South Wales, Victoria, and South Australia. It is a strictly migratory species, arriving in the neighbourhood of Sydney usually early in August, sometimes as late as the middle of September. The time of their arrival, like that of many other migratory species, depends to a certain extent on the season. If the winter is very mild and fine, they make their appearance in the beginning of August, but if cold and protracted not until three or four weeks later. Climatic influence is also an important factor as regards their departure. Generally they leave the neighbourhood of Sydney towards the end of March or early in April; but in the reed-bordered margins of Cook's River, I noted numbers of these birds in full song on the 29th April, 1894. The weather at that time was like spring, and on the same day I found many nests of *Melornis nove-hollandicæ*, some containing young, others fresh eggs. On the 27th May following, I saw young Butcher-birds (*Cracticus torquatus*) taken from a nest at Enfield. All migrants were unusually late in leaving that year, and the winter being very warm and mild, some species were only absent for a few weeks.

On their first arrival, these birds are extremely shy and wild. In company with Mr. J. A. Thorpe we heard several of these birds in a reed-bordered stream at Seven Hills on the 21st September, 1897. Requiring a fresh specimen for mounting, we tried to dislodge them from their cover, but they were very wary, and would not allow one to approach within shooting range. After being hunted for a time, they finally took refuge in some tall *Eucalypti*, in open forest land, a specimen being eventually procured among the higher branches of a tree, and fully one hundred yards from the creek. These birds usually frequent the reedy margins of rivers and lagoons, but in the late summer months one year I observed them in my garden in *Pittosporum eugenioides* shrubs, fully a mile from the nearest water. They are plentiful in the spring and summer months in the reed-bordered margins of Cook's River, near Sydney; the Yarra and Saltwater Rivers, near Melbourne; and the Torrens River at Adelaide. I have also seen them in the Botanic Gardens of these cities. In New South Wales the range extends into the Western District of the State, and Dr. A. M. Morgan has recorded it from Laura, about one hundred and forty miles north of Adelaide.

The stomachs of the birds I have examined contained the remains of small coleopterous insects and minute fresh-water molluscs.

It is almost impossible to convey any idea of the rich, melodious, and varied notes of this species, which in a locality where the birds are plentiful are almost continuous throughout the day. On bright moonlight nights, too, especially after a hot summer's day, it is refreshing to hear the "twitchee—twitchee—twitchee,—quarty—quarty—quarty," of the Reed Warbler, which is frequently poured forth at intervals throughout the night.

The nest is of a deep cup-shaped form, with the rim slightly narrower than it is in the centre of the structure. Outwardly it is built of the soft paper-like sheaths of reeds, chiefly *Typha angustifolia*, and decaying water weeds, and which are firmly woven around the stems between which it is placed; the inside being neatly lined with fine dried grasses. An average nest measures externally two inches and a half in diameter at the rim, three inches in the centre, and four inches in height, the inner cup one inch and three-quarters across, two inches

in the centre, and two inches in depth. The nest varies considerably in size and materials according to the position in which it is placed. One now before me, built against a thick bamboo cane, near where several thin leafy upright stems spring from the stalk, is a very deep cup-shaped structure, and is formed of portions of dried leaves, plant-down, dried grasses, and several pieces of thick soft string used for tying plants. This nest measures five inches and a half in height, and was built in a clump of bamboos in a nursery at Redfern, a suburb adjoining the city of Sydney. Two other nests shown to Dr. Ramsay and myself in the same nursery, were built between dock stems. With the exception of a small waterhole in the garden, they were far removed from permanent water. The nest is usually built between several upright reeds within two or three feet of the surface of the water, occasionally in drooping branches of trees overhanging or trailing in the water, and not infrequently it is placed in rank weeds or bamboo clumps some distance from water. When built between reeds, I have frequently found several at a distance of a yard or little more apart. In my early collecting days, the nests of this species were among the first I procured. A favourite resort of Reed Warblers, also of a number of water-fowl, was the reed-covered sheet of water, with open expanses here and there, at the back of the boat-sheds on the south side of the Yarra, near Prince's Bridge, Melbourne. On the Lower Yarra, too, the nests of these birds were very common in the late spring months. In this locality the advantage of having the nest wider in the centre and contracted at the rim was exhibited when a passing steamer would wash the water over the river banks and cause the reeds to sway in a violent manner from side to side. Near Sydney, Reed Warblers breed every season in the reeds or bulrushes in Centennial Park and Botany Water Reserve, but their nests are more numerous in the reed-lined margins of Cook's and George's Rivers. A nest in the Australian Museum collection, taken by Mr. S. W. Moore on Mooki Station, Liverpool Plains, on the 11th November, 1902, and containing three eggs, was built in an elm. Another, received from Mr. H. L. White, and taken at Belltrees, Scone, on the 17th November, 1902, with three fresh eggs, was built in a mulberry tree some distance from water.

The eggs, usually three, sometimes four in number for a sitting, are oval or compressed oval in form, the shell being close-grained and its surface glossy in some specimens, dull and lustreless in others. In ground colour they vary from faint bluish or greyish-white to pale yellowish-brown, which is finely freckled, spotted, or blotched with different shades of amber, brown, olive, and grey, the latter colour as a rule appearing as if beneath the surface of the shell. All the larger markings are irregularly shaped, in some specimens they are penumbral, in others one colour partially overlies another, and occasionally they are of a blackish-brown, or of a smeared ink-like hue. As a rule the markings, both large and small, are irregularly distributed over the surface of the shell, in other instances they are confined principally to the larger end, but it is very rarely they assume the form of a zone. A set of three, taken at Cook's River on the 7th October, 1896, measures:—Length (A) 0.78×0.55 inches; (B) 0.77×0.55 inches; (C) 0.79×0.56 inches. A set of four, taken in the same locality on the 6th December, 1897, measures:—Length (A) 0.81×0.36 inches; (B) 0.82×0.55 inches; (C) 0.79×0.58 inches; (D) 0.81×0.55 inches.

In New South Wales the breeding season of the Reed Warbler commences in September and continues until the end of February, during which time two broods are reared. Although eggs may be found from the third week of September until the end of December, nests with eggs are more numerous during October and November. Many nests, however, contain young birds at the end of October.

Acrocephalus gouldi.

WESTERN REED-WARBLER.

Calamoherpe longirostris, Gould, Proc. Zool. Soc., 1845, p. 29; *id.*, Handbk. Bds. Austr., Vol. I., p. 403 (1865).

Acrocephalus longirostris, Gould, Bds. Austr., fol., Vol. III., pl. 38 (1848); Seebohm, Cat. Bds. Brit. Mus., Vol. V., p. 99 (1881).

Acrocephalus gouldi, Dubois, Nouv. Man. d'Orn., Pt. VI., p. 369 (1901).

ADULT MALE—*General colour above brown washed with rufescent fawn colour, which is more pronounced on the lower back, rump, and upper tail-coverts; quills and upper wing-coverts brown, externally margined with rufous-fawn colour; tail feathers brown with narrow indistinct rufous-brown edges; a stripe extending from the nostril over the eye fawn colour; sides of the neck and all the under surface fawn colour, which is deeper in tint on the sides of the body, the abdomen and under tail-coverts, and passing into dull white on the throat and centre of the lower breast; bill brown, the under mandible yellowish-horn colour. Total length 6·5 inches, wing 2·85, tail 2·6, bill 0·65, tarsus 1.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Western and North-western Australia.

THIS species is an inhabitant of the western and north-western portions of the continent. It may be distinguished from *Acrocephalus australis* principally by its darker coloured plumage, and slightly longer bill. Specimens in the Australian Museum collection were obtained by Mr. George Masters at King George's Sound in March, 1869, and by the late Mr. T. H. Bowyer-Bower at Derby, North-western Australia, in 1886. Mr. Tom Carter, writing me from Point Cloates, North-western Australia, remarks:—"I saw several birds, which I took to be *Acrocephalus longirostris*, in dense rushes growing on the edge of a pool at Winning, fifty miles inland from here, in June, 1900, but failed to secure a specimen. In March, 1902, I shot a moulting or immature male of this species in dense reeds on the side of another pool. It was uttering notes resembling the gurgling song of the Spiny-cheeked Honey-eater, and like the birds first met with, it was only seen with great difficulty." A nest and set of two eggs of a Reed Warbler, probably referable to this species, has also been sent me for examination by Mr. C. French, Junr., taken on the Daly River in the Northern Territory of South Australia on the 1st February, 1902.

Relative to the Western Reed Warbler, the following are Gilbert's notes, quoted by Gould :—"It is to be found in all the dense reed-beds bordering the river and lakes around Perth, but it is so shy that it scarcely ever shows itself above the reeds. I have remarked also that it never wanders many yards from the nest, which is placed in four or five upright reeds growing in the water, at about two feet from the surface. It is of a deep cup-shaped form, and is composed of the soft skins of reeds and dried rushes. The breeding season comprises the months of August and September. The eggs are four in number, of a dull greenish-white, blotched all over, but particularly at the larger end, with large and small irregularly-shaped patches of olive, some being darker than the others, the lighter coloured ones appearing as if beneath the surface of the shell; they are three-quarters of an inch in length by five-eighths of an inch in breadth. It sings both night and day, and its strain is more beautiful and melodious than that of any other Australian bird with which I am acquainted, being in many parts very like to that of the far-famed Nightingale of Europe."

According to Canon Tristram[†] and the late Mr. H. Seebohm, all the species of *Tutarc* should be included in the genus *Acrocephalus*. In the fifth volume of the "Catalogue of Birds in

* Handbk. Bds. Austr., Vol. I., p. 403 (1865).

† "The Ibis," 1883, p. 38.

the British Museum," the latter writer omitted from the family Sylviidæ all the Reed Warblers inhabiting the small islets of the Pacific Ocean, with the exception of *Sylvia syriaca*, Kittlitz, found on the island of Ponape. Mr. Seeböhm having admitted that he was wrong in leaving them out, Dr. Sharpe had therefore to place them with the Timeline birds and perpetuate Lesson's genus *Tatare* for their reception, including in it also Seeböhm's *Acrocephalus syriaca*. Specimens of *Calamoherpe rehsei*, Finsch, recently received from Pleasant or Nawodo Island, and which species Dr. Sharpe had to include in the genus *Tatare*, show no difference in external characters to warrant their separation from the Australian members of the genus *Acrocephalus*. Even including the different species of Reed Warblers from the Pacific Islands in the genus *Acrocephalus*, it is not then so comprehensive as the genus *Malurus*, which comprises in it a species (*M. alboscapulatus*) inhabiting New Guinea, so widely divergent in the relative measurements of bill and tail from the type of the genus, *M. cyanus*. As pointed out by Dr. Finsch, *Calamoherpe syriaca* in Ponape is a true Reed Warbler, confined to the reed swamps, and building its nest in the reeds, in the same manner as our *Calamoherpe turdoides*. In Ruk and the Mortlock's, *C. syriaca* leads an arboreal life and nests in trees, as is also the case on Nawodo, where swampy grounds and reeds are absent."¹ The bird found on the latter island was subsequently characterised by Dr. Finsch under the name of *Calamoherpe rehsei*. Canon Tristram, in describing *Acrocephalus pistor* from Fanning Island,² also points out that the eggs of this species are like those of *A. turdoides* of Europe.

The members of Lesson's genus *Tatare* being included under the older generic name of *Acrocephalus*, the specific name of *longirostris*, bestowed by Gmelin in 1788 on the species inhabiting the Society Islands, cannot be used for the Western Australian Reed Warbler. Dubois, in his "Nouveau Manuel d'Ornithologie," has therefore distinguished the latter bird under the name of *Acrocephalus gouldi*.

Genus STIPITURUS, Lesson.

Stipiturus malachurus.

EMU WREN.

Muscicapa malachura, Shaw, Trans. Linn. Soc., Vol. IV., p. 242, pl. 21 (1798).

Stipiturus malachurus, Gould, Bds. Austr., fol., Vol. III., pl. 31 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 339 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 100 (1883).

ADULT MALE—Forehead and crown of the head light rufous, the latter streaked with black; hind neck and mantle ashy-brown, passing into ochraceous-brown on the lower back and rump, all the feathers on these parts having black centres, but which are broader and more conspicuous on the hind-neck and mantle; upper wing-coverts ochraceous-brown, the greater coverts with broad black centres; quills dark brown, the inner secondaries margined with ochraceous-brown; tail feathers blackish-brown, six in number and loosely webbed, the outermost feathers about half the length of the central pair; cheeks and ear-coverts ochraceous-brown, the latter with whitish shaft lines; a narrow line of feathers over the eye, chin, throat, and fore-neck light blue; centre of the breast whitish; remainder of the under surface ochraceous-brown, darker on the sides of the body, thighs, and under tail-coverts; bill blackish-brown; legs pale olive-brown, feet slightly darker, soles of feet light ochraceous-brown; iris dark brown. Total length in the flesh 7 inches, wing 1·65, two central tail feathers 4·3, bill 0·35, tarsus 0·8.

* Cat. Bds. Brit. Mus., Vol. v., p. 100 (1881).

† "The Ibis," 1881, p. 247.

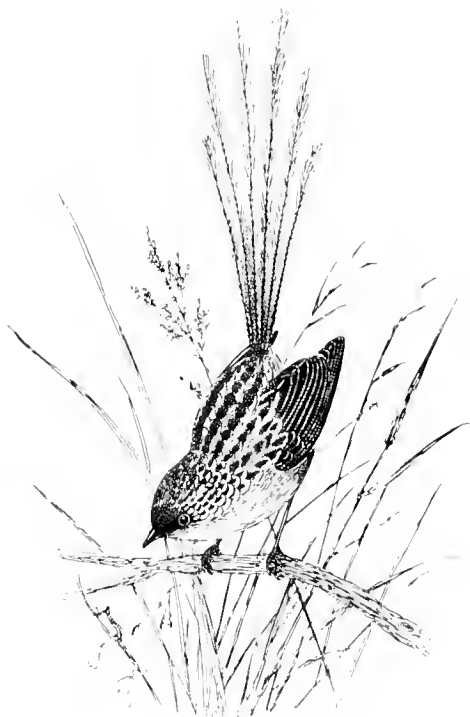
‡ "The Ibis," 1883, p. 45.

§ Nouv. Man. d'Orn., p. 369 (1901).

ADULT FEMALE—*Resembles the male, but has the head ashy-brown, and broadly streaked with black like the hind-neck and mantle; and the narrow line of feathers over the eye, and the chin, throat, and fore-neck is ochraceous-brown instead of light blue.*

Distribution—South-eastern Queensland, New South Wales, Victoria, South Australia, Western Australia, Tasmania.

THE present species is widely distributed throughout the coastal districts of the south-eastern and southern portions of the Australian continent; it is likewise found in Tasmania. It was originally described from specimens obtained near Sydney, and it is still numerous in the neighbourhood of the city. Specimens obtained from different parts of south-eastern Australia, and Badger Head, Tasmania, are alike in colour, but adult males from King George's Sound have the rufous crown slightly darker, and it extends further back on to the nape; in two examples the black streaks to the feathers extend on to the forehead, and the tail feathers are longer. The wing-measurement of eastern and western birds varies from 1·6 to 1·75 inches, and the central tail feathers from 4·2 to 5 inches.



EMU WREN.

It is a resident species in New South Wales, and is common in all favourable situations in the coastal districts. Near Sydney it may be met with in the Centennial Park, and in the swamps and heath lands about Randwick, Botany, and La Perouse. It is, however, more freely distributed around the low-lying shores of Manly Lagoon and Narrabeen Lagoon, particularly where it is overgrown with clumps of long rushes and grass tussocks. Several examples of both sexes were obtained during visits to these localities in company with Mr. J. A. Thorpe. It is a difficult species to shoot, for although it may rise up close to your feet, it quickly drops into cover again. Many specimens, too, are spoilt by having one or more of the delicate and lengthened tail feathers cut off, especially when the bird is shot at from a short

range. In the late autumn and winter months they are usually associated in small flocks, probably a pair of adults accompanied by their young. They are seldom flushed from the same clump or tussock in which they have sought refuge, for directly they have reached cover with their low squeaking call note they rapidly thread their way through or around the clumps, and congregate together again. Just prior to taking flight, one will frequently run up to the top of one of the tallest rushes or grass stems in the clump, and immediately fly off accompanied by its companions. During the breeding season I have, as a rule, met with the Emu Wren frequenting chiefly the stunted undergrowth on heath lands and sandy wastes, and sometimes far removed from water. In these situations, owing to their short and rounded wings, and necessarily poor powers of flight, they are easily driven to take the shelter of any low bush, but it is most difficult to discover them in the place where they have sought refuge. I have never found the nest, but have had many exciting chases after young birds although very few captures, owing to the manner in which they can conceal themselves in even the smallest bush.

A nest containing three fresh eggs, found by Mr. George Masters at King George's Sound, Western Australia, on the 5th November, 1858, is a dome-shaped structure with a small entrance near the top, formed externally of dried grasses, with which is intermingled egg-bags of spiders and their green silky coverings, the inside being lined entirely with fine dried grasses. It measures externally five inches and a half in height by three inches in diameter, and across the entrance one inch. Mr. Masters informs me it was built in a rigid-leaved shrub, about eighteen inches from the ground.

The eggs are usually three, sometimes four in number for a sitting, oval or thick ovals in form, the shell being close-grained, smooth, and almost lustreless. They are of a delicate white ground colour, which is more or less sprinkled with freckles, irregular shaped spots, and a few small blotches, varying in tint on different specimens from a pale chestnut-red to bright red, the markings as a rule being more thickly disposed on the larger end. A set of three, taken by Dr. Ramsay at Long Island at the mouth of the Hunter River, on the 25th September, 1861, measures as follows: Length (A) .66 x .48 inches; (B) .61 x .48 inches; (C) .62 x .47 inches. Two eggs in the collection of Mr. Charles French, junr., taken by Mr. G. E. Shepherd at Western Port, Victoria, measure: (A) .67 x .47 inches; (B) .67 x .48 inches. The eggs of the Emti Wren more closely resemble those of the Superb Warbler than any other species.

Young males are duller in colour than the adults, and destitute of the pale rufous forehead and crown; the feathers of the upper parts are tinged with ochraceous-brown and are less distinctly streaked with black; tail feathers shorter but the webs longer and closer together than in the adult; feathers above the eye pale ochraceous-brown; chin and throat very light blue. The wing measurement of some specimens often equals and sometimes exceeds that of adult examples. Length of wing 1.7 inches; tail 2 inches.

Genus SPHENURA, *Lichtenstein*.

Sphenura brachyptera.

BRISTLE BIRD.

Turdus brachypterus, Lath., Ind. Orn., Suppl., p. xliii., (1801).

Dasycotis australis, Gould, Bds. Austr., fol., Vol. III., pl. 32 (1848).

Sphenura brachyptera, Gould, Handbk. Bds. Austr., Vol. I., p. 312 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 104 (1883).

ADULT MALE—*General colour above brown, and having a slight rufescent tinge which is more pronounced on the rump and upper tail-coverts; upper wing-coverts like the back, the inner series of the greater coverts slightly more rufescent; outer webs of the quills rufous brown, their inner webs brown; tail feathers rufescent brown; lores and an indistinct line above the eye whitish; throat and centre of the breast dull white; remainder of the under surface brown, darker on the sides of the body; lengthened lower flank feathers, thighs, and under tail coverts rufescent-brown; bill brown, the under mandible pale brown; legs and feet brown; iris brown. Total length in the flesh 8.8 inches, wing 3.1, tail 4.3, bill 0.6, tarsus 1.1.*

ADULT FEMALE—*Similar in plumage to the male, but slightly smaller.*

Distribution.—New South Wales.

I HAVE never seen a specimen of this bird from any part of Australia, except the coastal districts of New South Wales, its range extending from the Richmond River in the north to as far south as the Clyde River in the Illawarra District. Near Sydney it frequents the scrubby undergrowth between Manly and Newport, also between Bondi and La Perouse, but it is now extremely rare. Mr. Masters informs me that many years ago, while shooting at

Screen 12: CONCLUSIONS.

$$\frac{d}{dt} \left(\frac{1}{2} m \dot{x}^2 \right) = \frac{d}{dt} \left(\frac{1}{2} m \dot{y}^2 \right) = \frac{d}{dt} \left(\frac{1}{2} m \dot{z}^2 \right) = \frac{d}{dt} \left(\frac{1}{2} m \dot{\theta}^2 \right) = \frac{d}{dt} \left(\frac{1}{2} m \dot{\phi}^2 \right)$$
$$\frac{d}{dt} \left(\frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x} \quad \text{for } x \in \mathbb{R}^n$$
[illegible]

are alike, 0·6 inches. When held away from the light, the lustrous greyish centres to the tips of the feathers of the head, hind-neck, and back of *S. longirostris*, giving these parts a spangled appearance, will however, in addition to its smaller size, readily enable one to separate the two species.

While collecting on behalf of the Trustees of the Australian Museum, at King George's Sound, Western Australia, in November, 1868, Mr. George Masters was successful in procuring ten adult specimens of this species. Mr. Masters informs me that these birds keep in the thick undergrowth near the coast, and that they are almost as difficult to procure as *Atichia clamosa*, owing to their frequenting such dense haunts. Eight specimens of *A. clamosa* were also obtained by Mr. Masters during his stay in Western Australia.

A nest of *Sphenura longirostris*, found by him at King George's Sound, is oval in form with a large entrance at the side, and is composed entirely of long dried hollow grass-stalks, with a small portion of grass of a finer description placed inside at the bottom of the nest, and underneath this slight lining a quantity of soft reddish-brown fibre; it measures six inches in length, five inches in width, and four inches in height, and was placed among some dried vegetation close to the ground. It contained two eggs, thick ovals in form, the shell being close-grained and its surface lustrous. They are of a dull white ground colour, which is minutely freckled and spotted with irregular shaped markings of wood-brown and purplish-brown, but particularly on the larger end, where intermingled with underlying clouded blotches, they are confluent and form a zone; the markings on one specimen being of a slightly darker brown, and the zone on the larger end more clearly defined. Length (A) 0·9 x 0·72 inches; (B) 0·91 x 0·73 inches. The eggs of this species resemble those of a variety of *Drymedes brunneoflagita*.

Sphenura broadbenti.

RUFous-HEADED BRISTLE-BIRD.

Sphenura broadbenti, McCoy, Ann. & Mag. Nat. Hist., Ser. 3, Vol. XIX., p. 185 (1867); Gould, Bds. Austr., fol., Suppl., pl. 25 (1869); Sharpe, Cat. Bds. Brit. Mus., Vol. VII, p. 106 (1883); North, Proc. Linn. Soc. N.S.W., Vol. XXII., p. 58 (1897).

ADULT MALE—General colour above brown, the hind-neck, mantle and upper portion of the back with a slight ashy tinge and gradually passing into a rufescent-brown on the lower back, rump, and upper tail-coverts; wings brown, with a rufescent wash which is more pronounced on the outer webs of the quills; tail feathers rufescent-brown; head dull rufous, with indistinct dark brown centres to the feathers; an acute angle-shaped patch in front and a narrow line of feathers around the eye dull white; ear-coverts rufous; cheeks and chin dull white; feathers of the throat blackish-grey, with broad greyish-white margins, those on the fore-neck and upper breast duller in colour and having pale brown margins; lower breast dull brown with indistinct whitish margins to the feathers; centre of the breast dull white; flanks brown, slightly tinged with olive; under tail-coverts brown, with a rufescent shade; under side of tail feathers when viewed in certain lights golden-olive; bill brown, the under mandible slightly paler; legs and feet brown. Total length 10·5 inches, wing 3·6, tail 5, bill 0·7, tarsus 1·3.

ADULT FEMALE—Similar in plumage to the male, but slightly smaller.

Distribution.—South-western Victoria.

THIS fine Bristle-bird was discovered in 1858 in a dense scrub about twenty-four miles from Portland Bay, Victoria, by Mr. Kendal Broadbent, who presented a single example of it to the National Museum, Melbourne. It was first described by Sir Frederick McCoy in the "Annals and Magazine of Natural History" in March, 1867, who named it in honour of its discoverer. Subsequently the specimen from which his description was taken

was forwarded to England to Mr. Gould, who figured it in his "Supplement to the Birds of Australia." For many years after but few of these birds had been obtained, and in 1883 evidently there was not an example of it in the British Museum when Dr. Sharpe prepared the seventh volume of the "Catalogue of Birds," for on page 106 he there transcribes Sir Frederick McCoy's original description and his accompanying note giving the locality where the bird had been procured. By some oversight, however, Dr. Sharpe has erroneously recorded the habitat of this species as the "Interior of South Australia." The Rufous-headed Bristle-bird as yet has only been found in the dense scrubs of south-western Victoria, and is probably more abundantly distributed in the ranges and gullies of the Otway Forest than elsewhere. The settlement of portion of this area, and the forming of marine resorts at Loutit and Apollo Bays, has proved that this bird is by no means a rare species, although, like its congeners, it keeps out of sight as much as possible, and its note is more often heard than the bird is seen.

The preceding descriptions are taken from a fine pair of adult birds kindly lent by Mr. R. Hall. The male was procured in the Heytesbury Forest, Victoria, on the 1st April, 1898, and the female also in the same locality on the 14th August, 1899.

Of three specimens in the Australian Museum collection, a young bird was obtained by Mr. Broadbent at the same time as he secured the type, in December, 1858; and two not quite fully plumaged specimens were recently received from Mr. H. E. Hill, procured at the mouth of the St. George River, near Lorne, in December, 1895.

Relative to this species, Mr. Hill has kindly supplied me with his notes:—"In December, 1893, a party of us from the Gordon Technical College, Geelong, were camped on the St. George River, near Lorne. In the scrub along the valleys we frequently heard a cry resembling the noise made by a barrow-wheel that required oiling. As soon as it ceased it was answered by a single note from the opposite side of the valley, following so close on the cry that at first we took it to be made by a single bird. At Apollo Bay, in December of the following year we heard a few of them, but obtained only a glimpse of a solitary example. At Lorne again, in December, 1895, the same party being out, we found it very abundant and tame compared to what it was at our camp there two years before. This was probably due to the bush fires of the previous season, destroying a great deal of cover on the St. George, enabling one to more easily see these birds. During this trip the identity of what was hitherto known to us as the 'Cartwheel-bird,' was established by Mr. B. Purnell securing two fine specimens of *Sphenura broadbenti*. Camped at Lorne by myself, I found them very numerous in the gullies in January, 1898; and heard them in January of the following year at Dean's Marsh, but where they seemed scarce. As you know, they are not too easy to get. I was watching one in a potato patch for two hours without being able to get a shot at it. They hop about quite close to you if you lie still—so close that if you fired at them you would blow them to bits, and directly they move away a yard or two you lose sight of them in the scrub. On one occasion I saw a bird fly across a small gully. Its flight was heavy and laboured, as one would expect from the appearance of the bird."

Two nests of this species, found in the thick undergrowth of gullies in the Otway Forest, were oval-shaped structures somewhat loosely put together, with an entrance at the side, and were made externally of dried plant-stems, wiry fibrous roots, and dried grasses, the inside being almost exclusively lined with rootlets. These nests were found in November, and each contained two fresh eggs. Two eggs now before me are of a dull purplish-white ground colour, one specimen having numerous freckles and spots of purplish-brown evenly distributed over the surface of the shell, and the larger end slightly tinged with slaty-grey; the other is similar in colour, but is more finely and thickly marked, and has a darker cap of confluent markings on the larger end. These eggs are in form slightly swollen ovals, and are thin-shelled. Length (A) 1.07 × 0.84 inches; (B) 1.09 × 0.85 inches.

Young birds are brown above, with a rufescent tinge which is more pronounced on the lower back and rump; upper tail-coverts, tail, and wings rich rufescent-brown; lores, forehead, sides of crown, and ear-coverts brown, strongly washed with rufous; feathers of the chin, throat, and fore-neck dull white, tinged with rufous, and having narrow indistinct dusky margins or tips; centre of the breast dull white, tinged with rufous; remainder of the under surface brown, with a strong rufescent tinge; under tail-coverts pale rufescent-brown; the under surface of the tail feathers has a lustrous golden-brown sheen when held away from the light. Total length 9.5 inches, wing 3.4, tail 4.5, bill 0.6, tarsus 1.3. In specimens exhibiting a further progress towards maturity, there is a triangular-shaped patch of dull greyish-white feathers in front of the eye; the feathers of the chin, throat, and centre of the breast are margined with whitish-brown, and those of the fore-neck and upper breast with pale brown; remainder of the under surface as in the adult male, but the thighs and under tail-coverts have a more pronounced rufous shade.

Genus *AMYTIS*, Lesson.

Amytis textilis.

GRASS WREN.

Merion nauté, Quoy et Gaim., Voy. de l'Uranie, Atlas, pl. xxiii, fig. 1.

Malurus textilis, Quoy et Gaim., Voy. de l'Uranie, Zool., p. 197 (1824); North, Rep. Horn Sci. Exped. Centr. Austr., Pt. II., Zool., p. 79 (1896) (part).

Amytis textilis, Lesson, Traité d'Orn., Atlas, p. 454, pl. 67, fig. 2 (1831).

ADULT MALE—General colour above dark brown, each feather having a narrow mesial stripe of white down the centre, these streaks being less distinct on the lower back and rump, which is rufescent-brown; lesser wing-coverts rust-red; the median and greater wing-coverts brown, with dull rufescent-brown margins and buffy-white shaft streaks; quills brown, the primaries externally margined with ashy more broadly at the base, the secondaries having dull rufescent margins; upper tail-coverts brown, with indistinct rufescent-brown margins and paler brown shaft-streaks; tail feathers brown, margined with pale brown; fore part of the head dusky brown and similarly streaked like the back; lores light rust-red; ear-coverts dusky brown, mesially streaked with dull white; anterior portion of the cheeks black with white shaft streaks; all the under surface pale buffy-brown, the chin, throat, and fore-neck mesially streaked with dull white, each feather being indistinctly bordered with rufescent-brown; sides of the breast dull rust red; centre of the abdomen with a slight ashy shade; thighs and under tail coverts dark brown. Total length 6.2 inches, wing 2.5, tail 3.2, bill 0.4, tarsus 0.9.

Distribution.—Western Australia, Central Australia.

THE type of *Amytis textilis* was obtained during the "Voyage of the Uranie," by Quoy and Gaimard, at Shark Bay, Western Australia. Gould states that he also obtained it in New South Wales, but I do not think the birds he procured and which he figured in his "Birds of Australia," under the name of *Amytis textilis*, are applicable to that species. The only specimens of this bird I have seen were obtained by the Horn Exploring Expedition in Central Australia in 1894. Mr. G. A. Keartland also informs me that he obtained similar birds in Western Australia during the journey of the Calvert Exploring Expedition in 1896, but they were abandoned in the desert near Johanna Springs.

Mr. Keartland writes me as follows, relative to this species:—" *Amytis textilis* is an inhabitant of Central and Western Australia, and in the latter State is a lover of dense

* Bds. Austr., fol. Vol. iii., pl. 28 (1848).

samphire, salt-bush, or spinifex, and seldom shows itself in open country. Occasionally it may be seen in the distance perched on a low mulga bush, or hopping about the ground in quest of food. It prefers running to flight, and is furnished with a strong pair of legs, carrying as much flesh on them as on the breast, but owing to the rough cover it frequents, the feathers are frequently worn off the upper parts of the thighs. At all stages, from the newly feathered young to the adult, the plumage is the same irrespective of sex. In passing where these birds are numerous, a low cheeping note is heard, but the bird will submit to the tussock being kicked before it flutters or runs to the next bush or tussock. They are very difficult to capture if wounded, as they run and hide like mice. At Brookman Creek I tore a low bush to pieces to find a bird I had winged, and after removing the last piece found it buried under a few dead leaves. These birds build close to the ground beside a tussock. The nest, which is loosely constructed of dried grasses, is a domed open-sided one, in which the eggs are plainly discernible."

The eggs are usually two in number for a sitting, oval or thick oval in form, the shell being close-grained, smooth, and slightly lustrous. Typically they are of a reddish-white ground colour, some specimens being almost pure white, which is thickly freckled or covered with small irregular-shaped spots and blotches of rich red or reddish-brown and fainter underlying markings, predominating chiefly on the larger end, where they frequently assume the form of a well defined zone:—Length (A) 0.77×0.6 inches; (B) 0.77×0.6 inches. A set of two, taken by Mr. C. E. Cowle on the 12th February, 1896, measures:—Length (A) 0.82×0.62 inches; (B) 0.77×0.62 inches. One egg is uniformly marked, the other distinctly zoned on the thicker end. Eggs of the different species of this genus resemble those of some types of *Cincloramphus rufescens*, and small eggs of *C. cruralis*, and to a less degree those of *Climacteris erythrops*.

Mr. Cowle informs me that in Central Australia the breeding season of *Amytis textilis*, like that of many other species depends entirely upon the season. Usually it is after the first heavy rains at the beginning of the year; nests with eggs being more often found in February, March, and April. In Western Australia Mr. Keartland secured a pair of fledgelings, unable to fly, during the month of August.

Amytis modesta.

THICK-BILLED GRASS-WREN.

Amytis textilis (nec Quoy & Gaim.), Gould, Bds. Austr., fol., Vol. III., pl. 28 (1848).

Amytis textilis, North, Rep. Horn Sci. Exped., Zool., p. 79 (1886), (part).

Amytis modesta, North, Vict. Nat., Vol. XIX., p. 103 (1902).

ADULT MALE—Like the adult male of *AMYTIS TEXTILIS*, Quoy & Gaimard, but distinguished from that species in having the head and upper parts of a much paler brown; the line extending from the nostril above the anterior portion of the eye of a very pale rust-red; the throat whitish; remainder of the under surface pale isabelline, slightly darker on the sides of the neck and breast, the former indistinctly streaked with white; sides of the abdomen, flanks, thighs, and under tail-coverts pale isabelline-brown; the bill, too, is deeper in shape and not so pointed at the tip as in that of *A. TEXTILIS*. Total length 6.5 inches, wing 2.55, tail 3.2, bill 0.42, depth at nostril 0.22, breadth at nostril 0.2, tarsus 0.95.

ADULT FEMALE—Similar in plumage to the male, but having indications, more or less, of a rust-red patch on each side of the breast.

Distribution.—Central Australia, South Australia, New South Wales.

SOME of the birds brought back by the Horn Scientific Expedition from Central Australia, and regarded by me as the immature female of *Amytis textilis*, Mr. G. A. Keartland has always contended belonged to a distinct species. In support of his

opinion he has since sent me several skins, and among them the adult male described above, obtained near Meerenie Bluff, Central Australia. This specimen agrees fairly well with Gould's figures of *Amytis textilis*, except that it has not any rust-red patch on each side of the breast, but this is apparent in a female shot at the nest. Others, obtained in South Australia and Western New South Wales, show more or less of this rust-red patch, the throat also being isabelline, and which together with the upper breast, is more distinctly streaked with white. None, however, approach any way near in depth of colour to what I regard as the true *Amytis textilis* of Quoy and Gaimard. These authors, in the Atlas of the "Voyage of the Uranie," also Lesson in his "Traité d'Ornithologie," represent *A. textilis* with the under as well as the upper surface distinctly streaked with white, while Gould figures the birds he procured on the plains bordering the Lower Namoi River in New South Wales with the under parts like those of the present species.

Among a collection of birds received for examination from the South Australian Museum, and made by Dr. A. M. Morgan and Dr. A. Chenery during a trip from Port Augusta to the Gawler Ranges in August, 1902, was a single example of *A. modesta*, of which Dr. Morgan remarks: "This species was seen occasionally from Nonning to Yardea. It was always found in large dark-leaved species of saltbush, very shy and active, hopping from bush to bush with astonishing rapidity. We did not see them attempt to fly."

Applicable to the present species are the following notes of the late Mr. K. H. Bennett:—"*Amytis textilis* is an inhabitant of the dense mallee scrubs in the neighbourhood of Mossgiel and Ivanhoe, in the Central District of New South Wales. I should have said were inhabitants, for although some few years ago they were numerous there, they have from some unexplained cause now almost entirely disappeared. For the past two years, 1885-6, I have been continually travelling over the country in which they were formerly abundant, and during all that time I have only met with a pair of these birds. This disappearance is, I think, due to their weak powers of flight, and to the occupation and stocking of the country and the burning off of the large areas of dense porcupine grass amongst which they could always be found. In former years I have often found their nests; they were generally placed in a tussock of porcupine grass, but sometimes I have discovered them in brush fences running through the mallee."

A specimen now before me, collected by the late Mr. K. H. Bennett in the Mossgiel District, is not *A. textilis* (Quoy et Gaim.), but the species I have distinguished under the name of *Amytis modesta*.

Nests of this species, found by Mr. C. E. Cowle are described as being similar structures to those of *A. textilis*, difficult of removal, and are usually built under a spinifex tussock.

Eggs two in number for a sitting, oval in form, the shell being close-grained, smooth, and slightly lustrous. They are of a reddish-white ground colour, which is freckled and spotted with rich reddish-brown, more abundantly on the thicker end. A set of two, taken by Mr. C. E. Cowle near Illamurra, Central Australia, measures as follows:—Length (A) 0.8 × 0.66 inches; (B) 0.8 × 0.67 inches.

***Amytis striata*.**

BLACK-CHEEKED GRASS-WREN.

Dasyornis striatus, Gould, Proc. Zool. Soc., 1839, p. 143.

Amytis striatus, Gould, Bds Austr., fol., Vol. III., pl. 29 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 337 (1865).

Amytis striata, Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 107 (1883).

ADULT MALE—General colour above chestnut-red, each feather having a central stripe of white bordered on each side with black; the rump chestnut-brown, and less distinctly streaked; lesser wing-coverts light rust-red, with narrow white shaft lines; the median and greater wing-coverts brown, the inner series of the latter indistinctly margined with dull chestnut-red; quills brown, the base of the primaries rust-red, the innermost secondaries margined with dull rust-red; upper tail-coverts brown, bordered with dull chestnut-red, and indistinctly streaked with white; tail feathers dark brown, margined with pale brown, more broadly on the outermost feathers; a broad line extending from the nostril above the eye light rust colour; a spot in front and the feathers below the eye white; ear-coverts black streaked with white down the centre; cheeks and a broad line below the ear-coverts black; chin and throat white; fore-neck and upper breast dull white with narrow dusky-brown streaks on each side of the feathers, giving these parts a distinctly streaked appearance; centre of the breast and abdomen pale yellowish-buff; a few feathers on the sides of the breast light chestnut-red, mesially streaked with white; flanks and thighs brown; under tail-coverts dark brown margined with white at the tips, and having indistinct buff shaft-streaks. Total length 6·8 inches, wing 2·5, tail 3·5, bill 0·4, tarsus 0·95.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—New South Wales, Victoria, South Australia, Central Australia, Western Australia, North-western Australia.



BLACK-CHEEKED GRASS-WREN.

THE range of the present species extends from east to west right across the central portion of the Australian continent. Gould procured the type on the Lower Namoi River, to the north of the Liverpool Plains, in New South Wales; and the late Mr. K. H. Bennett obtained specimens, also the nest and eggs, in the mallee scrubs and porcupine-grass areas in the Mossgiel District of the same State. Mr. C. French, Junr., sent me a rough skin for identification that was obtained by Mr. C. McLellan, on Pine Plains Station, in the Wimmera District of Victoria in 1902. It was met with by the members of the Horn

Scientific Expedition in Central Australia, in 1894, at Idracowra and Alice Well; and again, while a member of the Calvert Exploring Expedition in Western Australia, in 1896, Mr. G. A. Kearland and his companions obtained specimens, also nests and eggs, during their journey, but they were abandoned with the remainder of the collection at Johanna Springs, North-western Australia. Mr. Tom Carter also sent me a skin for examination from Point Cloates, and informed me that this species inhabited high stony spinifex ridges above the ranges, and he had seen fledglings on the 21st May, 1900.

Mr. G. A. Kearland, who met with this species both in Central and Western Australia, writes me as follows:—"Amytis striata is confined almost exclusively to spinifex country, hence it is frequently termed the 'Spinifex Wren.' It is the most wary and shy bird I have met with. Occasionally one may be observed at early morning or at sunset, perched on a low bush or spinifex tussock, giving forth a very nice song, but immediately it notices an intruder, it jumps to the ground and runs to the nearest shelter. During the journey across the Great Desert of North-western Australia by the Calvert Exploring Expedition, many of their nests were found which would have been passed had not the bird hopped off its eggs as we approached. The nest was made of soft strippings of old grass, with a large opening at the side. Two white eggs, sparingly dotted with bran-like markings, constitute the usual clutch."

A nest of this species, taken by the late Mr. K. H. Bennett in the Mossgiel District, New South Wales, in 1883, is an open structure composed throughout of bark fibre and the dried blades or spines of porcupine-grass, placed upon a foundation of pieces of bark; it measures four inches and a half in diameter and two inches and a half in depth; inside measurement two inches and a half in diameter by a depth of three-quarters of an inch. This nest was probably flattened out during removal, for others taken by Mr. G. A. Kearland and his companions in Western Australia, also by Mr. C. E. Cowle in Central Australia, are partially domed or oval structures, with a large entrance near the top or in the side, and were composed wholly of soft dried grasses. Like those found by the late Mr. K. H. Bennett, they were all placed close to the ground, and in or under the shelter of a spinifex tussock.

The eggs are oval in form, the shell being close-grained, smooth, and slightly lustrous. They vary from almost pure white to a reddish-white ground colour, which is more or less obscured with freckles, or small irregular shaped dots and spots of rich red or reddish-brown, some specimens having the markings uniformly distributed over the shell, while in others they predominate on the thicker end, and where in many instances a well defined zone or cap is formed. A set of three, taken at Mossgiel by the late Mr. K. H. Bennett in 1883, measures:—Length (A) 0.85 x 0.65 inches; (B) 0.84 x 0.63 inches; (C) 0.85 x 0.61 inches. A set of two, taken by Mr. C. E. Cowle at Ilamurra, Central Australia, in July, 1898, measures: Length (A) 0.8 x 0.66 inches; (B) 0.78 x 0.66 inches. The eggs of this species are not to be distinguished from those of *Amytis textilis*.

The usual breeding season of this species in Central Australia is the same as that of *A. textilis*, but Mr. Cowle has procured fresh eggs in July. In Western Australia, Mr. G. A. Kearland informs me that the members of the Calvert Exploring Expedition found nests with eggs and young in August and September.

Since the above was in type, I have received the February number of "The Victorian Naturalist," containing a very interesting paper on the genus *Amytis*, by Mr. G. A. Kearland.¹ It was received too late, however, except to give a reference to it here.

Genus EREMIORNIS, North.

Eremiornis carteri.

CARTER'S DESERT-BIRD.

Eremiornis carteri, North, Vict. Nat., Vol. XVII., p. 78 (1900); *id.*, *op. cit.*, p. 93 (1900); *id.*, *op. cit.*, Vol. XIX., p. 71, pl. opp. p. 72 (1902); Selater, Bull. Brit. Orn. Club, XII., p. 51 (1902); *id.*, Ibis, 1902, p. 608, pl. XIV.

ADULT MALE—*Lores and a distinct superciliary stripe dull white; forehead rufous; remainder of the upper surface brown tinged with rufous, becoming slightly more rufescent on the rump and upper tail-coverts; lesser and median wing-coverts like the back, the greater coverts fulvous-brown, with dark brown centres; quills dark brown, the primaries narrowly edged with dull ashy-rufous, tipped with fulvous-brown, the tips decreasing in size towards the central pair; ear-coverts pale washed on the margins of their outer webs with rufous, the four outermost feathers on either side and the secondaries margined on their outer webs with rufous; tail feathers dark brown slightly brown with distinct white shaft-streaks; sides of the neck ashy-brown; throat dull white passing into pale buff on the fore-neck and chest; centre of the breast and abdomen dull white washed with ochraceous-buff, and becoming darker on the sides of the body; under tail-coverts fulvous-brown, with a slight rufescent tinge and crossed on their apical portion with a broad subterminal band*

¹ "Vict. Nat.," Vol. xx., p. 133 (1904).

which decreases in extent and is almost lost on the smaller outermost feathers; under wing-coverts pale fulvous-brown; "bill horn colour, lighter at the base of the lower mandible; legs and feet purplish-brown; iris reddish-hazel;" (Carter). Total length 5·7 inches, wing 2·07, central tail feathers 2·7, outer tail feathers 1·7, central under tail-coverts 1·7, bill 0·46, tarsus 0·55.

ADULT FEMALE—Similar in plumage to the male, but slightly less rufescent on the upper parts.

Distribution.—North-western Australia.

THE present species was one of the novelties discovered by Mr. Tom Carter during his thirteen years residence in the neighbourhood of Point Cloates, in North-western Australia. The type specimen, now in the Australian Museum, was received by me through Mr. G. A. Kearland, who forwarded it for description together with the following note from Mr. Carter:—"I shot two of these birds on barren rocky ranges in the dense spinifex tufts." The specimen is labelled a female, and was obtained on the 1st July, 1899, at North-west Cape, near Exmouth Gulf. Another specimen in the Australian Museum collection was procured at Point Cloates on the 8th July, 1901. Several others from the same neighbourhood have been sent me for examination. I forwarded a specimen to London to Dr. P. L. Selater, one of the Editors of "The Ibis," who exhibited it at the February meeting of the "British Ornithologist's Club," in 1902, and made the following remarks:—"Eremiornis carteri: Mr. North kindly sends me an example of the supposed new genus and species of Australian birds. The genus is closely allied to *Schanicola*, of India,† and perhaps hardly distinct, but the specimen is not in very good condition, and I am unable to decide definitely upon it. It is at any rate a new species, and a most interesting addition to the Australian avifauna."

Before describing the genus *Eremiornis*, I carefully compared the specimen on which it is founded with the characters given in the "Catalogue of Birds in the British Museum,"‡ of the genus *Schanicola* and its allies, and concluded that it varied from all of them. Since then the Trustees of the Australian Museum have received two specimens of *Schanicola platyura* from the Director of the Travancur Museum, India, and the species upon which Jerdon founded the genus. These specimens strengthen me in my opinion that although *Schanicola* and *Eremiornis* bear a close resemblance to each other, especially in the broad tail feathers and the long upper and under tail-coverts, they are quite distinct. In *Schanicola* the bill is deeper and more curved at the tip, the rictal bristles stout, the primaries distinctly longer than the secondaries, the tail barely exceeding the length of the wing, the tarsi and feet long, the mid-toe when extended reaching beyond the ends of the longest under tail-coverts. In *Eremiornis* the bill is straighter, the rictal bristles feeble and hardly visible, the wing more rounded and distinctly shorter than the tail, the tarsi short and feet small, the mid-toe reaching when extended about half-way down the longest under tail-coverts. What I regard as constituting the chief point of distinction between the two genera is, that in *Schanicola* the tarsi and feet are long and strong as in *Acrocephalus* and other Reed-Warblers, while *Eremiornis* has the tarsi short and the feet comparatively small, the tarsus only equalling in length that of *Smicrorhis flavescens*, the smallest species of Australian birds. For the purpose of comparison the measurements of adult specimens of *Schanicola platyura* and *Eremiornis carteri* are here given. An adult male of *Schanicola platyura* measures:—Total length 6·1 inches, wing 2·6, tail 2·8, bill 0·46, tarsus 0·8. An adult male of *Eremiornis carteri* measures:—Total length 5·7 inches, wing 2·05, tail 2·7, bill 0·46, tarsus 0·55. The principal distinctions pointed out between *Schanicola* and *Eremiornis* will be seen in the Plate, reproduced from a photograph, which accompanies the above remarks,§ where skins of the two birds are laid side by side and figured of the natural size.

* Bull. Brit. Orn. Club, xii., p. 51 (1902).

† Cat. Bds. Brit. Mus., Vol. vii., p. 110 (1883).

‡ Cat. Bds. Brit. Mus., Vol. vii., p. 110 (1883).

§ Vict. Nat., Vol. xix., p. 72, and pl. opp. p. 72 (1902).

Subsequently Mr. Carter forwarded an adult male, obtained by him at Point Cloates on the 20th February, 1902, to Dr. Selater, who made critical remarks on the allied genera *Schoniola* and *Eremiornis*, and published a beautifully coloured plate of *Eremiornis carteri* in "The Ibis." A figure, showing the abnormally long under tail coverts is also given on page 609.

The slender bill, short tarsi, small feet, and long upper and under tail-coverts which conceal the greater portion of the broad tail feathers, will distinguish it from any other Australian genus.

The following information relative to this species has been kindly sent me by Mr. T. Carter from time to time: "*Eremiornis carteri* is fairly common on the North-west Cape peninsula. I have seen it both on barren spinifex ranges and on good feeding grassy flats. I have, however, met with it mostly in dense scrub between the range and the sea, but never saw it south of Yardie Creek, although the country is similar on both sides of it. During a trip up north in October, 1900, I shot four from the buggy while driving through scrub, and I saw several more. Upon dissecting them I found that they were all males and had apparently just finished breeding. The stomachs contained the remains of insects, principally small black beetles, but in one of them I found a grass-hopper an inch long. I have only heard these birds utter a short 'chat chat.' When disturbed it rarely flies for more than about twenty or thirty yards, a weak fluttering flight, with the tail feathers expanded, then down it goes into cover again and skulks through the scrub. It lies very close after being once flushed, and can conceal itself under the smallest cover. One fired at and wounded sought refuge under a small scrubby bush, bordered around with a little spinifex and a few dead leaves. These I removed until I came to the last remaining branch of the shrub, under which the winged bird, hard pressed to the ground, was discovered. On pulling the branch up, it fluttered away for a short distance but was soon captured. A nest, which I believe belonged to this species, I found when driving, by flushing a bird out of a species of salt-bush. On going to the bush I had seen it leave, I found a deep open nest built among the twigs, about a foot from the ground. It was irregularly formed throughout of dried grasses and fibre, and had no special lining. The inside of the structure contained a few fallen dead salt-bush leaves, and numerous elytra of a species of small black beetle. Young birds had apparently but recently left the nest."

Genus MEGALURUS, Horsfield.

Megalurus galactotes.

TAWNY GRASS-BIRD.

Malurus galactotes, Temm., Planch. Col., Tom. I., pl. 65, fig. 1 (1823).

Sphenacrus galactotes, Gould, Bds. Austr., fol., Vol. III., pl. 35 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 399 (1865).

Megalurus galactotes, Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 127 (1883); North, Proc. Linn. Soc. N.S.W., 2nd ser., Vol. X., p. 217 (1895).

ADULT MALE—Forehead, crown of the head and nape rufous, indistinctly streaked with dusky-brown; upper portions of the back ashy-brown washed with fulvous, and having black centres to the feathers; lower back, rump, and upper tail-coverts rich fulvous-brown, some of the longer tail-coverts having black shaft-streaks; upper wing-coverts fulvous-brown, the lesser and median series with indistinct black shaft-streaks, and the greater coverts, which are richer in colour, with broad black centres; quills brown externally margined on their outer webs with fulvous-brown, the innermost

* "The Ibis," 1902, p. 608, pl. xiv.

secondaries blackish-brown margined with fulvous-brown; tail feathers fulvous-brown with black shafts; lores and eyebrow dull whitish; ear-coverts brown with narrow white shaft-lines; under surface of the body dull white, the chest washed with yellowish-buff in the centre; sides of the body brown; abdomen, except in the centre, brown washed with yellowish-buff; under tail-coverts yellowish-buff. Total length 6·7 inches, wing 2·68, tail 3·7, bill 0·5, tarsus 0·9.

Distribution.—Northern Territory of South Australia, Queensland, New South Wales.

IN favourable situations the Tawny Grass-bird is found throughout the greater part of the coastal districts of Northern and Eastern Australia. In the Northern Territory of South Australia, Gilbert found it on the islands at the head of Van Dieman's Gulf; and the late Mr. Edward Spalding procured a number of specimens near Port Darwin. In Queensland, Mr. Gulliver obtained it at Normanton, near the shores of the Gulf of Carpentaria; Mr. Kendal Broadbent found it at Cardwell; and the late Mr. J. Rainbird procured specimens at Port Denison. Mr. George Masters collected specimens at Wide Bay, in October, 1867, on behalf of the Trustees of the Australian Museum; and the late Mr. George Barnard found it breeding on the Dawson River, about eighty miles inland from Rockhampton. I can find no authentic record of this species being obtained at Cape York. Mr. J. A. Thorpe informs me that neither he nor the late Mr. James Cockerell ever met with or procured this species during their stay at Cape York. Mr. Bertie Jardine, who has been a resident there all his life, also informs me that he has never observed it there.

Two specimens that were obtained in New South Wales, came from the Richmond River District; Gould saw examples that were procured on the Liverpool Plains; and in the Macleay Museum is an adult male and female obtained by Mr. George Masters at Rope's Creek, who informs me that he has also obtained this species at Long Bay. Both of these localities are in the neighbourhood of Sydney. It is not found in the southern or central portion of the State, neither does it occur in Victoria.

The preceding description is taken from a fine old adult male, obtained by Mr. George Masters at Wide Bay in October, 1867, and is the largest and richest coloured specimen I have seen. The wing-measurement of adult males now before me varies from 2·3 to 2·68 inches. The long acuminate central tail feathers will readily serve to distinguish this and the following species from any other grass or reed-haunting passerine bird found in Australia.

Although the range of the Tawny Grass-bird extends over the greater portion of the Northern Territory of South Australia, and Northern and Eastern Queensland, and parts of Northern New South Wales, it is of so shy and retiring a disposition that it is a species seldom met with. The late Mr. George Barnard, of Coomooboolaroo, Dawson River, Queensland, shortly before his decease, informed me that while collecting specimens of Microlepidoptera on his station on the 26th of October, 1893, he flushed one of these birds from the rush-bordered bank of a dry creek, and, after a diligent search, succeeded in finding its nest at the bottom of a tuft of long rushes. The nest was a deep cup-shaped structure, slightly domed or narrow at the top, and was outwardly composed of dried swamp grasses, lined inside with feathers, and contained three fresh eggs, two of which he unfortunately broke. The remaining egg was forwarded to me for description by Mr. Charles Barnard. It is precisely similar in colour and markings to those of its congener, *Megalurus gramineus*, but is slightly larger, being of a reddish-white ground colour, freckled all over with purplish-red markings, which predominate as usual on the thicker end of the egg. Length 0·8 × 0·58 inches. I also received an egg for examination from Mr. C. French, Junr., which was taken near the Daly River, in the Northern Territory of South Australia, in February, 1902.

Megalurus gramineus.

LITTLE GRASS-BIRD.

Sphenocercus gramineus, Gould, Proc. Zool. Soc., 1845, p. 19: *id.*, Bds. Austr., fol., Vol. III., pl. 36 (1848): *id.*, Handbk. Bds. Austr., Vol. I., p. 400 (1865).

Megalurus gramineus, Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 125 (1883).

ADULT MALE—*General colour above fulvous-brown, streaked with dull black, the latter colour being more pronounced on the feathers of the back which are broadly centred with dull black; rump and upper tail-coverts of a clearer fulvous-brown, and less conspicuously streaked with black; upper wing-coverts like the back; quills dark brown margined externally with fulvous-brown, the innermost secondaries blackish-brown distinctly bordered with straw-white and tinged with fulvous-brown; tail feathers brown, margined with fulvous-brown; forehead, crown, and nape fulvous-brown, tinged with rufous and streaked with black; lores and a distinct eyebrow dull white; a spot in front of the eye and a line along the upper portion of the ear-coverts brown; throat and all the under surface dull white, slightly tinged with fulvous-brown on the fore neck and breast, and passing into fulvous-brown on the sides of the body; the apical portion of the feathers on the throat and fore-neck being narrowly streaked with dark brown, and those on the sides of the body broadly streaked with blackish-brown; thighs fulvous-brown; under tail coverts pale fulvous-brown with slightly darker centres; bill olive-brown, paler on the sides; legs and feet olive-brown; iris brown. Total length in the flesh 6.25 inches, wing 2.4, tail 2.5, bill 0.4, tarsus 0.8.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution. New South Wales, Victoria, South Australia, Tasmania.

THE Little Grass-bird is abundantly distributed in favourable situations over the south-eastern and southern portions of the continent, it is likewise found in Tasmania and on some of the islands of Bass Strait. Although occurring inland, it evinces decided preference for the coastal districts. It frequents dense grass-beds growing in swampy localities, the rush or reed-bordered margins of watercourses, and near the coast the mangrove fringed estuaries or sides of rivers.

There is but little variation in a number of specimens now before me from different localities, but two examples, sexed as females, and which I take to be very old birds, are almost pure white on the throat and breast, which is entirely devoid of blackish-brown streaks. The wing-measurement of adult males varies from 2.1 to 2.3 inches.

In the neighbourhood of Sydney it is seldom seen or heard during the late autumn and winter months. Usually its plaintive call is first heard about the same time as that of the Reed-Warbler in August, and not later than the end of April. It is extremely shy and one does not often see it except when it utters its note from the top of some tall reed or grass-stem, or flies over a clear expanse of water from one clump of rushes to another.

The usual note of this species is a low mournful whistle repeated three times, which is immediately similarly answered by another bird, but it is pitched in a different key. Its plaintive note is easily imitated, and frequently in the summer months it may be heard during the night. Occasionally it is varied with a low and rapidly uttered "chu, chu, chu, chu," especially when one approaches near the nest of this bird.

Stomachs of two examples of this species I have examined, obtained at Long Bay, near Sydney, in March, 1869, contained in addition to the remains of small aquatic insects, perfect specimens of a small fresh-water shell, *Isidora*, *sp.*

Writing from Mossgiel, in the Central District of New South Wales, in 1886, the late Mr. K. H. Bennett remarks: "*Megalurus gramineus* is rather plentiful here during the spring months of a wet season, when the 'cane-swamps,' which are its exclusive habitat, contain shallow but

wide expanses of water. At this time it may always be found amongst the dense tussocks of 'cane-grass' growing in these swamps; but during the hot summer months, when the water has dried up, the most careful search would fail to reveal one of these little birds, although the 'cane-grass' is still as dense as ever. So feeble are their powers of flight that, if driven on to the plain, they can be easily caught, for they cannot fly more than a short distance at a time and so slowly that a man on foot can overtake them. It has often been a source of wonder to me how these birds vanish in the mysterious way they do, considering the open nature of the country between one cane-swamp and another, which are often miles apart."

Dr. W. Macgillivray writes me:—"I have not elsewhere come across *Megalurus grammacus* away from swampy localities except at Coleraine, in Western Victoria, where they are to be found frequenting and nesting in box-thorn hedges in the centre of the town. A swamp once existed in the locality many years ago, and force of habit no doubt tends to bring them back to their hereditary haunt, even though conditions have been entirely altered."

The nest varies greatly in size, the outer materials of which it is formed, and the position in which it is placed. Usually it is a deep cup-shaped structure, formed externally of dried aquatic plants and coarse grasses. Inside it is lined with feathers, the entrance being contracted at the top and sometimes partially hidden by one or two feathers worked into the inside which curl over the entrance. Others are dome-shaped or globular in form, with an entrance in the top, and are constructed externally of soft fibrous rootlets and slightly lined inside with feathers. In the vicinity of houses, domestic fowls' and ducks' feathers are more often used. An average nest measures externally five inches in height by four inches in diameter; depth inside, three inches. Near Melbourne, and in Albert Park, I have found as many as four nests containing the usual complement of four eggs, in a single afternoon. Each nest was built in the centre of a tussock of long rushes, within six or eight inches of the water; but in the swampy tea-tree scrubs that formerly lined the sides of the Lower Yarra River, I have found it constructed in the bushy forks of a tea-tree at a height of five feet. In the mangrove-covered tidal flats of the Upper Parramatta River, near Sydney, it is built among the upright leafy pronged branches of these trees; and in the neighbourhood of Tempe, Botany, and Manly and Narrabeen Lagoons, in the centre of a tuft of rushes, coarse grasses, or reeds, growing in or near the water.

The eggs are generally four in number for a sitting, less frequently three, and very rarely five. They vary from oval to elongate-oval in form, the shell being close-grained and its surface smooth and lustreless. Typically they are of a reddish-white ground colour, which is almost obscured with numerous freckles of purplish-red uniformly distributed over the surface of the shell. Some specimens have well defined zones or caps on the larger end, or have a few underlying markings of violet-grey, the latter shade predominating generally on the thicker end. One set I took was almost a pure white ground colour, and entirely devoid of markings except on the larger end, where they had a few minute freckles and a broad clouded zone of a deep purplish-red. As a rule the markings are small and seldom assume the form of blotches. A set of four, taken at Newington, on the Parramatta River, measures:—Length (A) 0.76×0.53 inches; (B) 0.77×0.54 inches; (C) 0.77×0.55 inches; (D) 0.75×0.54 inches. A set of three, taken at Cook's River, measures:—(A) 0.72×0.52 inches; (B) 0.72×0.55 inches; (C) 0.71×0.53 inches.

Mr. J. A. Thorpe has been successful in obtaining a number of the nests of this species in the neighbourhood of Randwick and Botany during the past ten years. Most of the nests with eggs were found in November and December, but the dates of obtaining them with fresh eggs range from 4th October to the 20th December. The sets taken were mostly four, not infrequently three, and in one instance five in number for a sitting.

August and the five following months constitute the usual breeding season of this species in New South Wales and Victoria.

Genus *CISTICOLA*, *Kaup.**Cisticola exilis.*

GRASS-WARBLER.

Malurus exilis, Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 223 (1826, *ex* Lath. MSS.)*Cysticola exilis*, Gould, Bds. Austr., fol., Vol. III., pl. 42 (1848).*Cysticola ruficeps*, Gould, Proc. Zool. Soc., 1837, p. 150; *id.*, Bds. Austr., fol., Vol. III., pl. 45 (1848).*Cisticola exilis*, Gould, Handbk. Bds. Austr., Vol. I., p. 350 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 269 (1883).

ADULT MALE—(*Breeding plumage*)—*General colour above golden-buff, the feathers of the back with a slight ashy shade, and broadly centred with brownish-black; upper wing-coverts like the back; primaries and outermost secondaries brown externally edged with golden-buff, the innermost secondaries blackish-brown margined with golden-buff; tail feathers brownish-black, edged and largely tipped with golden-buff; forehead and sides of the head and neck slightly darker than the crown; all the under surface pale golden-buff, slightly darker on the breast and flanks; under tail-coverts pale golden-buff; upper mandible brown, the lower mandible flesh colour; legs and feet flesh colour. Total length in the flesh 3·6 inches, wing 1·9, tail 1·2, bill 0·38, tarsus 0·72.*

ADULT FEMALE—(*Breeding plumage*)—*Similar to the male, but having the head broadly streaked with black like the back.*

WINTER PLUMAGE—(*Both sexes*)—*Like the breeding plumage of the female, but all the feathers having a distinct ashy shade, and all on the upper parts except those on the sides of the hind-neck more broadly streaked with black; throat and centre of the breast and abdomen ashy-white. Total length in the flesh 4·3 inches, wing 1·9, tail 2, bill 0·48, tarsus 0·72.*

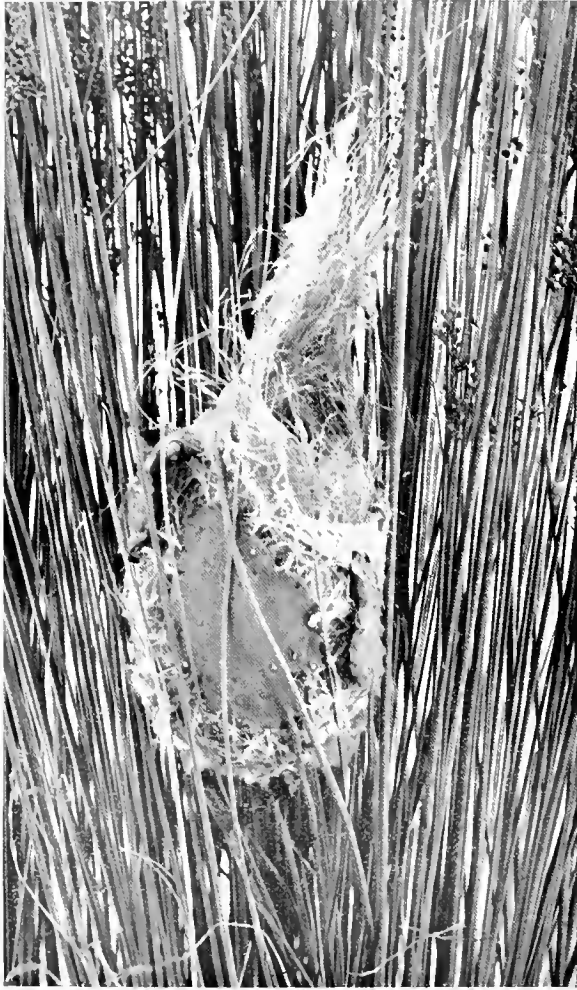
Distribution.—North-western Australia, Northern Territory of South Australia, Queensland, New South Wales, Victoria, South Australia, New Guinea, the Moluccas and Phillipine Islands, Formosa, Malayan Peninsula.

THIS little bird is chiefly an inhabitant of the coastal districts of Australia, in favourable situations, over which it appears to be generally distributed, except in the south-western portion of the continent. It is also found in New Guinea, the Moluccan and Phillipine Islands, Formosa, and South-eastern Asia. So much do these birds vary in colour in their seasonal changes of plumage, that it is difficult when one examines a large series from different parts of the continent, to believe that they all belong to one species. Dr. Sharpe has, however, conclusively proved that the four species described and figured by Gould in his folio edition of the "Birds of Australia," are all referable to the present species, *Cisticola exilis*. Not only do they vary in colour in the summer and winter plumage, but the tail feathers in the latter season are remarkably longer than in summer. The descriptions given above of this species in breeding plumage, are from specimens obtained while nesting on Ash Island, at the mouth of the Hunter River; those in winter plumage being obtained at Randwick, close to Sydney. The tails of adult males obtained in summer vary in length from 1·05 to 1·3 inches, of others procured in winter 1·8 to 2·1 inches. Among breeding or summer-plumaged adult males, examples obtained in Eastern Queensland and Eastern New South Wales, have the heads darker than in others procured in South Australia; the under surface, too, of birds from the latter State is uniform and of the same colour on the flanks. The lightest coloured specimen I have before me was procured at Derby, North-western Australia. It has the head and the under surface almost white, the former being slightly washed with golden-buff, and which is

* Cat. Bds. Brit. Mus., Vol. vii., p. 269 (1883).

more pronounced on the forehead; the upper surface, wings, and tail are correspondingly paler than typical examples of *C. vilis*, and only the feathers on the upper portion of the back have brown centres; wing 1.9 inches. This specimen has that bleached and washed out appearance common to many species inhabiting this and similar hot and arid districts.

Of adult males in their progress from the breeding or summer plumage to winter plumage, there is an example in the collection obtained by Mr. J. A. Thorpe at Long Bay, near Sydney, on the 17th March, 1896. This specimen shows the new tail feathers replacing the slightly



NEST OF GRASS WARBLER.

abraded old ones, and some of the golden-buff feathers on the crown of the head are broadly streaked with black; wing 1.9 inches. Another adult male, shot on the banks of the Hawkesbury River on the 14th February, 1897, is in the ordinary breeding plumage, but the rich golden-buff feathers of the head have two short black streaks on the crown, and several similar markings on the nape; wing 1.8 inches.

Undoubted preference is shown by this species for coastal districts. I have never met with it very far inland, or in mountain ranges any distance from the coast, nor is it found at all in the interior of the continent. Grass-beds, tussocks of long rushes, heath-lands, and standing grain-crops are its favourite haunts, and from its habit of frequenting and nesting in the latter situations it is locally known in many parts of New South Wales as "Corn" or "Barley-bird." It possesses an animated but squeaky kind of song, which, compared with the size of the bird, may be heard some distance away. Frequently it is uttered while perched upon the top of a grass-stalk, but immediately an intruder ventures near, the bird seeks refuge in the cover below. The

stomachs of all the specimens I have examined contained only the remains of minute insects. Near Sydney these birds are not uncommon about Randwick, Long Bay, and La Perouse, also between Manly and Narrabeen, where they have been frequently found breeding.

The nest is a small domed-shaped structure, with an entrance near the top, and is formed chiefly of very fine grasses, and lined and coated with plant-down and spider's webs woven together, and has usually several leaves carefully worked on to the outer portion of the structure. Sometimes it is placed between three or more plant leaves springing from a single stalk, which, being drawn together, conceal all but the entrance. In ten nests now before me the number of leaves attached to the outer portion of each varies from three to eleven in

number, but frequently they are formed without any outer covering of leaves. An average nest measures four inches and a half in height, by two inches and a quarter in width, and across the entrance one inch. The entrance varies much in size; in a nest in the Group Collection of the Australian Museum, taken by Mr. J. A. Thorpe at Randwick, on the 14th October, 1895, and built in a tuft of fine rushes, the entrance, which is near the top, measures two inches and a quarter in height by one inch in breadth; in another now before me it is contracted by the leaves sewn on either side, and is barely over half an inch in width. The nest is generally built among long grass, in a tuft of rushes, or in a plant sheltered by grass, and frequently in cultivated crops, at a height varying from six inches to two feet from the ground. In New South Wales and Queensland it is often constructed among blady-grass. Mr. Acland Wansey brought three nests to the Australian Museum that he had found while mowing millet at Dungog on the 11th January, 1902. All had leaves worked on to the sides and tops of the structures, two of them being attached to millet stems, and the third to the leafy top of a weed in which it was built. They were about two feet from the ground, and contained respectively three and four eggs, and a single egg, all being fresh.

The nest figured on the preceding page, is one of two presented by Mr. A. F. B. Hull, and taken by him at Curl Curl, near Manly, in February, 1903. The outer portion of the structure, which is formed of plant-down and spiders' webs, is almost hidden by nine terminal leaves, springing from long thin plant stalks, being carefully worked on to it by the birds. The stitches made by the birds driving their bills around the margin of the leaves and forcing through the spiders' webs, are clearly visible and may be seen in one of the leaves in the illustration. This nest, which contained four fresh eggs, measures externally nearly six inches in height by two inches and three-quarters in width, and across the entrance one inch and a half. The other nest has only five leaves worked on to the outer portion of it; both of them were concealed in long rushes.

The eggs are usually three or four in number for a sitting, oval in form, the shell being close-grained, smooth, and lustrous. Typically in ground colour they are of a rich greenish-blue, which is sparingly freckled, spotted and blotched with different shades of purple, particularly on the larger end, where in some specimens the markings are confluent and form a small but well defined zone. A rare variety has a faint bluish-white ground colour, with fine pepper-and-salt markings of faint purple thickly distributed over the shell. Others have a few large rusty-brown blotches on the larger end only, while some I have seen were entirely devoid of markings. As a rule the ground colour is of a rich shade of blue, and the markings predominate or are entirely confined to the thicker end. Of a set of three, taken by Mr. J. A. Thorpe at Randwick, two specimens are sparingly sprinkled with dots and spots on the larger end, the other has the markings confined to a conspicuous zone on the smaller end. A set of three eggs, taken at Dungog, New South Wales, measures as follows:—Length (A) 0.55×0.42 inches; (B) 0.54×0.43 inches; (C) 0.55×0.44 inches. A set of three, taken on the Herbert River, Queensland, measures:—(A) 0.61×0.48 inches; (B) 0.62×0.5 inches; (C) 0.59×0.49 inches. A set of four, taken near the Daly River in the Northern Territory of South Australia, measures:—(A) 0.58×0.44 inches; (B) 0.6×0.45 inches; (C) 0.58×0.45 inches; (D) 0.56×0.44 inches.

Young birds of both sexes resemble the winter plumage of the adult female, but are duller in colour, the feathers on the hind-neck and rump alone showing a distinct wash of golden-buff, those on the under surface being dull white with a faint tinge of yellowish-buff on the neck and golden-buff on the sides of the body. Wing 1.6 inches. A young male procured by Mr. R. Grant at Five Dock, on the 12th March, 1901, has the throat white and the remainder of the under-surface very pale greenish-yellow, washed with buff on the sides of the body, which is slightly darker on the lower flanks. Wing 1.6 inches.

This species is a late breeder, nests with eggs being more often found in New South Wales in December, January, and as late as February. On the Herbert River, Queensland, Mr. J. A. Boyd procured nests with eggs on the 23rd January, and on the 7th and 15th February, 1894, and saw fledgelings just able to fly in the following September; nests with three fresh eggs in each, he again found on the 19th and 25th January, 1895. Mr. C. French, Junr., has also sent me for examination nests and eggs of this species taken in the neighbourhood of the Daly River, in the Northern Territory of South Australia, on the 30th January and 6th February, 1902. Two sets, containing four eggs in each, are of the typical rich ground colour and markings, but some eggs are paler and more sparingly marked than others procured in the eastern and southern portions of the continent. A set of three also contained an egg of the Rufous-tailed Bronze Cuckoo (*Lamprococyx basalis*).

Family TIMELIIDÆ.

Genus CHTHONICOLA, Gould.

Chthonicola sagittata.

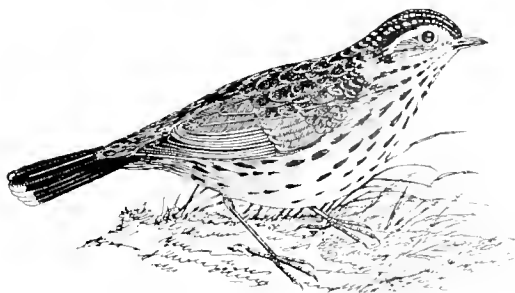
STREAKED WARBLER.

Sylvia sagittata, Lath., Ind. Orn., Suppl., p. liv., (1801).

Chthonicola minima, Gould, Bds Austr., fol., Vol. III., pl. 72 (1848).

Chthonicola sagittata, Gould, Handbk. Bds. Austr., Vol. I., p. 390 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 290 (1883).

ADULT MALE—General colour above dull olive-brown, broadly streaked with dark brown: rump bright olive-brown; upper wing-coverts like the back; quills brown, the outer webs of the primaries having narrow whitish edges and the secondaries indistinct olive margins; two central tail feathers brown, the remainder brown narrowly edged with olive and passing into blackish-brown on the apical portion which is tipped with white; head dark brown, narrowly streaked with brownish-white; lores whitish; feathers around the eye and a distinct eyebrow white, the latter bordered above with a black streak, which widens out on the side of the nape; a spot in front of the eye and the ear-coverts pale brown; behind the ear-coverts a conspicuous patch of pale olive-yellow feathers; sides of the neck and all the under surface white, slightly washed with olive-yellow and streaked with black, centre of the lower breast almost pure white; flanks and under tail-coverts pale yellowish-buff; bill dark brown; legs and feet brown; iris light yellow. Total length in the flesh 5 inches, wing 2.45, tail 1.9, bill 0.35, tarsus 0.8.



STREAKED WARBLER.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Queensland, New South Wales, Victoria, South Australia.

THE present species is freely distributed in New South Wales and some parts of Victoria. Mr. E. R. Morgan has taken its nest and eggs near Dalveen on the highlands of the Darling Downs, Southern Queensland; and I have received for examination, from the Director of the South Australian Museum, a skin obtained by the late Mr. F. W. Andrews in the Gawler Ranges on the 26th September, 1882. Mr. Zietz informs me this is the only instance he has known of its being found in South Australia.

I have retained the original vernacular name of Streaked Warbler, bestowed by Latham on this species in 1801. Following his description he remarks:—"Inhabits New South Wales in July: is said to sing remarkably well."

It is a resident in New South Wales, and frequents chiefly the open forest and partially cleared lands of the coastal districts. Inland it is generally found on the margins of cultivation paddocks and pastoral lands. It is also common in lightly timbered mountain ranges, and there are specimens in the Australian Museum collection, obtained at Lithgow at an elevation of over 2,000 feet. Near Sydney it is fairly numerous at Belmore, Enfield, and Blacktown, also in the scrub and heather-lands about Sutherland and National Park. In March these birds assemble in flocks from five to fifty or more in number, and may be generally met with searching for insects and their larvæ in the grass. They are very fearless and not easily disturbed, but when put to flight generally seek refuge in the lower limbs of a small tree. Their notes, which are very sweet, are succeeded by a short harsh grating twitter.

The stomachs of these birds I have examined usually contained insects and their larvæ; in some I also found a few grass-seeds.

The nest, a dome-shaped structure with an entrance in the side, is formed outwardly of dried grasses, with which are intermingled a few fine strips of bark, and is slightly lined at the bottom with either downy grass, seeds, fur, or feathers, or an admixture of these or other soft materials. An average nest measures externally four inches and a half in diameter by three inches and a quarter in height, and across the entrance one inch. It is built in a slight depression in the ground, the entrance to the structure being well concealed and nearly on a level with the surface. Usually it is surrounded with withered grass or herbage, but at Belmore I have seen it constructed in a tuft of long rank green grass. Some I have found were almost flat on the top, and it was difficult to distinguish them from the surrounding withered grass. Mr. S. W. Moore found several of this type in September, 1896, in a paddock at Blacktown, which, with the exception of a few stunted and dried grass tussocks, was devoid of vegetation. One I found on the 16th October, 1898, at Roseville, in company with Mr. C. G. Johnston, was built close to a well beaten path, and was sheltered only by a few straggling grasses and a scanty bracken-fern. It contained two fresh eggs, and I would have passed it a hundred times without discovering it had I not observed a bird leave the spot when we were about twenty yards away. If the nest is handled, this species readily forsakes it, even when eggs are deposited.

The eggs are usually three, sometimes four in number for a sitting, rounded ovals or broad ellipses in form, the shell being close-grained, smooth, and lustrous. They are of a uniform bright chocolate-red, some specimens having a clouded indistinct cap or zone of a darker shade of the ground colour on the larger end. A set of three, taken in the Richmond River District, by Mr. P. Schraeder in September, 1888, measures:—Length (A) 0·72 × 0·6 inches; (B) 0·77 × 0·62 inches; (C) 0·73 × 0·6 inches. The nest from which this set was taken also contained an egg of the Fan-tailed Cuckoo. A set of three, taken at Belmore, near Sydney, in November, 1897, measures:—Length (A) 0·75 × 0·58 inches; (B) 0·76 × 0·6 inches; (C) 0·75 × 0·59 inches.

Young birds resemble the adults in colour, but have the head of a duller brown and not so distinctly streaked; there is a dull rufous-fawn eyebrow, and the blackish markings to the feathers on the under surface are smaller and more tear-shaped in form.

September and the three following months constitute the usual breeding season of this species in New South Wales; but at Haslem's Creek, near Sydney, in company with Mr. S. W. Moore, the latter found a nest built in a tuft of grass and ready for the reception of eggs on the 1st August, 1894.

* Lath. Gen. Syn. Bds., Suppl. II., p. 247 (1801).

Genus *HYLACOLA*, Gould.*Mylacola pyrrhopygia*.

RED-RUMPED SCRUB-WARBLER

Acanthiza pyrrhopygia, Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 227 (1826).

Mylacola pyrrhopygia, Gould, Bds. Austr., fol., Vol. III., pl. 39 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 346 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 346 (1883).

ADULT MALE—General colour above brown, with a rufescent-olive tinge which is more pronounced on the lower back and rump; upper tail-coverts pale chestnut; wings like the back; inner webs of the quills brown, the apical half of the outer webs of the primaries externally edged with ashy-brown, their bases dull whitish which is almost entirely concealed by the brown primary coverts; tail feathers brown, tinged with rufescent-olive, and all but the central pair crossed by a subterminal black band and tipped with ashy-brown; a spot in front of the eye dusky-brown; a distinct line extending from the nostril over the eye whitish; ear-coverts brown, with white shaft-lines; under surface of the body dull white, each feather except on the centre of the abdomen with a longitudinal streak of blackish-brown down the centre; under tail-coverts chestnut; thighs brown; bill dark brown; legs and feet flesh colour tinged with grey; iris hazel. Total length in the flesh 5.5 inches, wing 2.15, tail 2.45, bill 0.45, tarsus 0.8.

ADULT FEMALE—Similar in plumage to the male, but has all the under surface pale buff and less distinctly streaked, the dark brown centres being narrower, shorter, and not extending so near the tips of the feathers; centre of the abdomen whitish.

Distribution.—New South Wales, Victoria, South Australia.

THE Red rumped Scrub Warbler is found only in the south-eastern portions of the continent. It is a resident in New South Wales, and although distributed in favourable situations over the greater portion of the coastal districts of the State, nowhere is it more abundant than in the stunted scrub-covered lands lying between the Hawkesbury River and Botany Bay. Inland it is found as far as the western slopes of the Blue Mountains, but there may be regarded as a very rare species. I have never seen an example from any of the northern coastal districts of New South Wales, and Mr. C. W. De Vis, M.A., informs me that he has never seen or heard of it being obtained in any part of Queensland. In a southerly direction its range extends into Western Victoria, and Mr. H. C. Smart has sent me a specimen for examination shot in the Grampians on the 10th January, 1898. From the Director of the South Australian Museum, Adelaide, I have also received a specimen obtained at Square Waterhole, near Mount Compass, in the hills south of Adelaide. This is the farthest point west I have seen a specimen from.

Near Sydney I have only observed it in the scrubby undergrowth or thick bush growing in the shallow sandy soil which more or less covers the outcrops of Hawkesbury Sandstone. From Middle Head to Hornsby, and Bondi to La Pouse, are its favourite haunts, but one may walk through the scrub all day without getting a glimpse of this bird unless acquainted with its habits.

About Middle Harbour, in June or July, I have generally met with it frequenting the more open parts of the country, studded here and there with low clumps of Dwarf Apple-trees (*Angophora cordifolia*), and stunted *Banksia*, between which flourish *Xanthorrhœas* and the rock-loving *Isopogons* and *Epacridæ*. At this time of the year they usually traverse the low undergrowth singly, and are not so wary, but it is difficult to see them for they are almost constantly on the move. I have heard a bird give a shrill double note quite close to me; the next time it is uttered, which is generally at an interval of a few minutes, it may be twenty or thirty yards away, without once exposing itself to view. About once or twice in every half

hour, however, it will ascend on to some dead branch higher than the surrounding vegetation and pour forth a most melodious song, and as soon as it is finished dive into the low undergrowth again, or more rarely fly off to some distance. Its notes are also sometimes uttered in a very low strain as the bird trips over the fallen leaves or rapidly flits from bush to bush. At Middle Harbour, in sandy soil, sparsely covered with low herbage, I once counted seven of these birds from where I stood.

In August or September they leave these open parts and may be met with in pairs in the more dense and higher scrub, or frequenting rocky boulders on the margin of it. At this season, if one remains quiet, they are sometimes far from shy, and the male will utter its sweet cheerful notes from the top of a low bush only a few yards away. On many occasions I have searched the scrub for hours, meeting with perhaps a solitary individual which appeared to be travelling, and by its actions, assured me that I was not within the vicinity of its nest. These birds run with marvellous rapidity over the tops of rocks and large boulders.

When perched, the chestnut-coloured rump is displayed to advantage, also the black sub-terminal bar on the tail, which is carried erect.

The stomachs of the birds I have examined contained only the remains of small insects, principally beetles.

A nest I found at Middle Harbour was a dome-shaped structure, with a small spout-like entrance near the top, and was outwardly formed of strips of bark and grasses, and lined inside principally with feathers, among them being a few from the breast of *Pachycephala gutturalis*. It measures externally six inches in height, by three inches and three-quarters in diameter, and was placed in a thick bush (*Isofogon areathifolia*), the bottom of the nest being within four inches of the ground.

Eggs usually two in number for a sitting, oval in form, the shell being close-grained and its surface slightly lustrous. They vary in ground colour from a warm pinkish-white to a very faint purplish-buff, which is freckled and blotched with irregular-shaped markings of light chocolate-brown, confined principally to the thicker end where a more or less well defined zone is formed. A set of two, taken at North Shore, measures:—Length (A) 0.77 × 0.58 inches; (B) 0.76 × 0.57 inches. They resemble the eggs of *Sericornis frontalis*, more than those of other species, but are slightly more pointed at the thinner end.

Judging by the few nests of this bird found, the breeding season near Sydney commences at the end of August, or early in September, and continues until the end of December. Two fledgelings in the Australian Museum collection were obtained in the scrubby undergrowth at Middle Harbour, in October, 1876. I also watched for some time a young bird being fed by its parent, near Roseville, on the 6th October, 1901. On attempting to secure it, the young one feebly flew into some undergrowth and successfully managed to conceal itself, which it repeated when I passed by the same place an hour afterwards.

Fledgelings have the general colour above rufescent-brown, which is of a richer shade of rufous on the lower back and rump; upper tail-coverts chestnut; wings brown with a rufous wash, the primary coverts with blackish tips, and the median and greater wing-coverts with dull buffy-white tips; lores and eyebrow buffy-white; sides of the head brown washed with rufous; chin, throat, and fore-neck dull rufous; remainder of the under surface dull white washed with rufous, the latter colour being more distinct on the sides of the body; under tail-coverts chestnut; thighs brown. Wing 1.75 inches.

Semi-adult males have the spot in front of the eye brown, the white line above the eye narrower, the quills more strongly washed with rufous, and the tips of the greater wing-coverts rufescent or buffy-white.

Hylacola cauta.

SHY SCRUB-WARBLER.

Hylacola cauta, Gould, Proc. Zool. Soc., 1842, p. 135; *id.*, Bds. Austr., fol., Vol. III., pl. 40 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 317 (1865).

ADULT MALE.—General colour above brown, the back washed with rufescent-olive, which is more pronounced on the rump; upper tail-coverts rich chestnut; wings brown, with a faint rufescent-olive tinge to the outer webs of the secondaries and the inner series of the greater wing-coverts; tips and margins of the median and greater coverts white; basal portion of the outer webs of the outer primaries white, which is followed by a blackish wash towards the centre of the feathers, and then by a narrow edge of ashy-white on their apical half, except at the tips; primary coverts blackish, and only partially concealing the white bases to the outer webs of the primaries which form a conspicuous white spot towards the centre of the wing; tail feathers blackish-brown, the central pair and outer webs of the remainder washed with reddish-brown; tips of the four central feathers ashy-brown, the remainder being largely tipped with white; a spot in front of the eye blackish-brown; a line extending from the nostril over the eye white, bordered on the forehead by a narrow line of black; ear-coverts brown with white shaft lines; sides of the neck brown; under surface of the body white, each feather conspicuously streaked with blackish-brown down the centre, except on the centre of the abdomen; under tail-coverts chestnut; thighs brown; bill blackish-brown; legs and feet fleshy-brown. Total length 5·5 inches, wing 2·2, tail 2·3, bill 0·5, tarsus 0·85.

Distribution.—Victoria, South Australia, Western Australia.

THE range of this very distinct species extends across the extreme southern portion of the Australian Continent. While collecting on behalf of the Trustees of the Australian Museum, Mr. George Masters procured an adult male at Mongup, Salt River, Western Australia, in 1869. I have also received on loan a young male from the Director of the South Australian Museum. Mr. A. Zietz, the Assistant-Director, informs me that it was procured by the late Mr. F. W. Andrews on the 13th October, 1897, who observed a small flock of these birds hopping about in the scrub at Talem Bend, to the north of Lake Alexandria. From Western Victoria I have also received for examination a fine old adult male obtained by Mr. H. C. Smart at Nhill on the 26th September, 1899. This specimen is slightly larger in size than average examples of *Hylacola pyrrhopygia*, the wing measuring 2·2 inches.

From *H. pyrrhopygia* this species may at once be distinguished by the larger white bases to the outer webs of the outer primaries forming a spot near the centre of the wing, and by its richer and darker coloured upper tail-coverts. The tail feathers, too, are almost uniformly coloured, not crossed by a distinct band, and the lateral ones are largely tipped with white. On the under surface the streaks are larger and darker, and those on the centre of the forehead are almost black.

Under the name of *Hylacola pyrrhopygia*, Mr. W. White, of Reedbeds, near Adelaide, forwarded me in January, 1894, a set of two eggs, together with the following note:—"These eggs were taken on the 1st October, 1893, from a dome-shaped nest rather flattened on the top, with a protruding entrance, and formed of twigs and grasses with a lining of finer grasses and other soft material. The nest was placed about a foot from the ground, in a stunted and very thick prickly acacia-bush growing near the mouth of the American River, Kangaroo Island." On application for a skin of the bird for the purpose of verification, under date 15th March, 1894, Mr. White writes me:—"I looked through most of my collection to-day, but could not find a skin of the *Hylacola*, however I send you the remains of one that I shot on York Peninsula, South Australia, in mistake and threw it into my bag until I came home. I then put it on one side as it was of no use, but you will possibly be able to make out from it what you want." The specimen forwarded by Mr. White proved to be *H. cauta*,

and not *H. pyrrhopygia*. Gould procured the type of *H. cauta* in the scrubs clothing the Murray River in South Australia, which is not a very great distance from either Kangaroo Island or York Peninsula. The eggs procured by Mr. White on the latter island are more swollen in form than those of *H. pyrrhopygia*, the shell being close-grained and its surface smooth and slightly glossy. They are of a very faint purplish ground colour, with minute freckles of purplish-brown of a slightly deeper shade on the larger end, forming on one specimen a small but fairly well defined zone, the other specimen being somewhat similarly but less distinctly marked. Length (A) 0·74 × 0·6 inches; (B) 0·78 × 0·6 inches. These eggs are very much like those of a variety of *Scircornis frontalis*.

In the general colour above, the young male resembles the adult, but the margins of the inner secondaries have a more decided rufous wash, and the wing-coverts are tipped with buffy-white; the white streak above the eye is narrower and tinged with buff; the throat and fore-neck is dull greyish-white, broadly streaked with pale rufous; the centre of the breast and abdomen is white, and the sides of the body brown. Wing 2·08 inches.

Genus ACANTHIZA, Vigors & Horsfield.

Acanthiza nana.

YELLOW-BREASTED THORN-BILL.

Acanthiza nana, Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 226 (1826); Gould, Bds. Austr., fol., Vol. III., pl. 60 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 371 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 292 (1883).

ADULT MALE—*General colour above dull olive-green; lesser and median wing-coverts like the back, the greater coverts and the innermost secondaries dusky-brown margined with dull olive-green; remainder of the quills dusky-brown externally edged with olive-yellow; tail feathers ashy, margined with olive-green, more broadly on their basal portion, and crossed with a subterminal black band, the tips of the inner webs of the feathers paler and passing into almost pure white on the extreme edge; lores dusky; feathers above the eye yellow; ear coverts dull olive-green with whitish shaft-streaks; sides of the neck dull olive-green; all the under surface yellow, slightly tinged with olive; the chin and throat washed with ochraceous-buff; sides of the body olive-green; centre of the abdomen and under tail-coverts yellow; bill dark brown, basal half of lower mandible pearl-grey; legs and feet greyish-black; iris yellowish-white. Total length in the flesh 4 inches, wing 1·9, tail 1·4, bill 0·3, tarsus 0·7.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—New South Wales, Victoria, South Australia.

THE species belonging to the closely-allied genera *Acanthiza* and *Geobasilus*, are widely distributed in favourable situations over Southern Australia, and both are also represented in Tasmania. Being strictly insectivorous, and often frequenting orchards and gardens in search of food, they are most useful little birds. To many residents of Eastern Australia they are well known under the comprehensive local names of "Tomtits," and "Dickies," the two species belonging to the genus *Geobasilus* being furthermore distinguished by the names of "Yellow-tail" and "Brown-tail."

The present species is freely dispersed throughout the eastern portions of New South Wales, and particularly in the neighbourhood of Sydney, where it is a permanent resident. Near the coast it frequents the light undergrowth, chiefly acacia and gum sapling scrubs. In autumn it associates in small flocks, and may be often seen in the same tree in company with *Acanthiza pusilla* and *A. lineata*, diligently prying among the leafy recesses for minute insects which constitute its sole food. Like *A. lineata*, it is strictly arboreal in habits, always building

in trees, and is seldom if ever seen on the ground, except for the purpose of obtaining material to form its nest.

The usual note of this species is a short, sharp, and rapidly uttered "tiz, tiz, tiz," and somewhat resembles that of the female of *Malurus superbus*.

From South Australia, Dr. A. M. Morgan writes me:—" *Acanthiza nana* is fairly common about Laura, one hundred and forty miles north of Adelaide, and also at the River Finniss. I have not met with it elsewhere in South Australia. On the 30th October, 1895, I found a nest on the Rocky River near Laura. It was a dome-shaped structure, outwardly composed of sheep's wool, and lined with feathers, and was suspended by the top to the upper twigs of an acacia locally known as the 'Broughton willow.' The nest was about twenty-five feet from the ground, and contained three slightly incubated eggs. The female was shot from the nest."

The nest is either a rounded-oval or nearly spherical in form, with a narrow entrance near the top, and is formed of thin strips of dried bark, bark fibre, and fine grasses, matted up with spider's webs, and ornamented on the outside with the egg-bags of spiders, or green mosses; the inside being usually lined with fine dried grasses, feathers, or the white silky down from the seed-pods of the introduced cotton plant. An average nest measures three inches and a half in height by two inches and a half in diameter, and across the entrance one inch. They vary much in outward appearance, some being composed chiefly of strips of red stringy bark, others are thickly coated with green mosses, and some are largely decorated with the white egg-bags of spiders, more like the typical nests of *Acanthiza lineata*. A nest found at Canterbury, near Sydney, on the 18th September, 1898, was formed of exceedingly fine grass-stems matted with cobwebs, a few egg-bags of spiders, and thickly coated with the pale green bearded lichen (*Usnea barbata*), the inside being lined with similar dried grasses and white fowls' feathers. The outer portion of the nest was very evenly made, and I was able to peel it off in one piece, like the rind of an orange, leaving the inner wall and lining of the nest perfect. This nest was built in the bushy end of a branch near the top of an acclimatised *Pinus insignis*, at a height of twenty feet from the ground, and contained two eggs, also one of the Bronze Cuckoo (*Lamprolaima placens*). When frequenting gardens, I have on several occasions known these birds to construct their nests in pines, and they were only found by watching the birds while they were engaged in building them. Usually they are built among thin leafy twigs, sometimes of gum saplings, but preference is shown for the tops of tea-trees or the outside twigs of different species of acacia, more especially when in flower. They are generally placed at a height from ten to thirty feet from the ground, and higher as a rule than the nests of any other species of *Acanthiza* inhabiting the neighbourhood of Sydney, or of the allied genus *Geobasilus*. The nest is never built near the ground, like that of *Acanthiza pusilla*.

The eggs are three in number for a sitting, oval in form, the shell being close-grained, smooth, and lustreless. They are of a dull white ground colour which is conspicuously freckled and blotched with different shades of purplish-red, intermingled with a few similar underlying markings of dull lilac, in some instances the markings being uniformly distributed over the shell, in others predominating or confined almost entirely to the larger end, where a more or less well defined zone is formed. Typically the eggs of this species may be distinguished from those of any other of the genus by the darker colour and larger size of the markings. A set of three, taken at Canterbury, near Sydney, in September, 1897, measures as follows:—Length (A) 0.65 × 0.43 inches; (B) 0.65 × 0.46 inches; (C) 0.64 × 0.44 inches. Another set taken in the same locality in December, 1901, measures:—Length (A) 0.62 × 0.45 inches; (B) 0.63 × 0.45 inches; (C) 0.68 × 0.44 inches.

August and the four following months constitute the usual breeding season of this species. Evidently two broods are reared, for eggs may be usually found early in September, and again

in November and December. I have a set of three, taken on the 2nd September, 1892, and I saw the same pair of birds working at a half-constructed nest nine days later.

This species, which is locally known about Sydney as the "Yellow Dicky" is a common foster-parent of the Bronze Cuckoo (*Lamprolaima flagellatus*) and the Rufous-tailed Bronze Cuckoo (*L. basalis*).

Acanthiza pusilla.

SCRUB THORN-BILL.

Motacilla pusilla, White, Journ. Voy. N. S. Wales, pl. opp. p. 257 (1790).

Acanthiza pusilla, Gould, Bds. Austr., fol. Vol. III., pl. 53 (1848); *id.*, Gould, Handbk. Bds. Austr., Vol. I., p. 364 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 291 (1883).

ADULT MALE—*General colour above brown washed with dull olive-green: upper wing-coverts like the back, the greater series with dusky centres: quills dusky-brown externally edged with olive-brown: upper tail-coverts light rufous-brown: tail feathers brown, edged with ruddy-olive and crossed with a distinct subterminal black band except on the central pair: tips of the extreme edge of the inner webs of the lateral feathers white: forehead pale rufous with dusky concealed centres to the feathers: ear-coverts olive-brown with whitish shaft-streaks: chin, cheeks, sides of the neck and throat dull white with dusky-grey bases and narrow blackish edges at the sides of all the feathers, giving these parts a distinctly mottled appearance: centre of the breast and abdomen dull white tinged with fulvous: sides of the breast pale fulvous-brown, becoming richer and deeper in colour on the flanks: under tail-coverts pale fulvous: bill black: legs and feet dark brown: iris brownish-red. Total length in the flesh 1.25 inches, wing 2, tail 1.8, bill 0.3, tarsus 0.27.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Southern Queensland, New South Wales, Victoria, South Australia, Kangaroo Island.

THE present species was the first discovered of the genus, being poorly figured and meagrely described by White in his "Voyage to New South Wales" in 1790. There can be but little doubt that *Savicula macularia*, figured and described by Quoy and Gaimard in the "Voyage of the Astrolabe," as pointed out by Dr. Sharpe, is identical with this species. I know that it is a common bird at Western Port, Victoria, where the French naturalists obtained the type. Vigors and Horsfield gave the first accurate diagnosis of *Acanthiza pusilla* in the "Transactions of the Linnean Society of London."

A close ally of this species, *Acanthiza apicalis*, inhabits the western portions of the continent, specimens examined from some parts of South Australia combine the characters of both *A. pusilla* and *A. apicalis*; while yet another hardly distinguishable species, *A. diemenensis*, is found in Tasmania.

Some adult specimens are of a much brighter olive-green colour on the upper parts than others, but the most marked difference exists in the depth of colour of the rufous-brown upper-tail-coverts. The wing measurement of adult males varies from 1.9 to 2.1 inches.

Generically its name is particularly applicable to *A. pusilla*, for it lives almost exclusively in thickets and bushes, and is never found far from them or in open forest country. Coastal scrubs and the dense undergrowth of the contiguous mountain ranges are its favourite haunts. I found it very common in the tea-tree scrubs on the beaches of Port Phillip Bay, Victoria; also in the undergrowth near the mangrove flats of the upper portion of Western Port Bay. From the South Australian Museum, I have received for examination two adult specimens

* Trans. Linn. Soc., Vol. xv., p. 227 (1826).

obtained in October, 1903, about twenty miles west of Port Victor; and an adult male obtained by Dr. A. M. Morgan in October, 1903, at Dalveen, on the highlands of the Darling Downs, Southern Queensland. It is a resident species in the neighbourhood of Sydney, and is very common between Manly and Newport, also on the highlands of the Milson's Point railway-line. The tails of adult specimens I collected on the coast at Narrabeen are shorter and more strongly washed with ruddy-olive than examples procured by Mr. J. A. Thorpe at Tarana, on the Blue Mountains: the former averaging 1.63 inches in length, and the latter 1.9 inches.

It utters a clear warble, somewhat resembling that of *Sericornis frontalis*, but I am unable to convey any idea of its sound by words. Like the other members of the genus, it is entirely insectivorous.

The nests are rounded-oval or dome-shaped structures, with an entrance near the top, and are rather roughly formed externally of shreds and strips of bark, coarse grasses, and a



NEST OF SCRUB THORN-BILL.

small quantity of spider's webs all matted up together, but not as a rule so neatly woven as the nests of *Acanthiza lineata*, the inside being lined with feathers, hair, fur, or the white silky down from the pods of the introduced cotton-plant. An average nest measures externally four inches and a half in length, by three inches and a quarter in breadth, and across the entrance, which is slightly protected with a hood, one inch. Generally they are built near the ground, and are usually attached to the under side of the common bracken fern, the stem of a low shrub, or in thick bushes particularly those covered with debris, or suspended from the scrubby twigs of a tree. At Narrabeen, where I saw these birds lining their nests as early as the 20th June, all of them were built in bracken ferns. In company with Mr. C. G. Johnston, a nest was found at Roseville on the

30th August, 1898, in a single-stemmed geebung, only nine inches in height, the bottom of the structure being two inches off the ground. It contained two half-fledged young, and while we were resting on the ground close to the nest, one of the parents came within two feet of us. Although alarmed at our intrusion, the common devices to draw one away from the nest were not resorted to in this instance. A remarkable nest was found by the late Mr. Neville Cayley in the scrub on the beach at Woonona, in the Illawarra District, which he pointed out to me on the 5th November, 1896. The nest, a small dome-shaped structure, with a narrow rounded entrance, was suspended from the top to a thin branch of a tea-tree, at a height of four feet from the ground. Externally it was entirely covered with very thin twigs of a *Leptospermum*, which hung perpendicularly around the structure, resembling very much a huge cocoon of the larvæ

of a moth. We flushed a bird from it on our approach and found the nest contained two fresh eggs, but the bird would not venture near while we were in the vicinity. Returning again towards the evening I succeeded, by placing my hand over the entrance of the nest, in capturing the owner while sitting, and found it was *Acanthiza fusilla*. After examining the bird, during which time it courageously picked at my finger, I restored it to liberty.

Mr. H. R. Elvery, of Alstonville, near Ballina, at the mouth of the Richmond River, sent me a skin and set of three eggs of this bird for identification, and informed me that he had taken altogether four sets of these eggs at different times from re-lined old nests of *Sericornis citreogularis*. Previously I had never heard of an instance of this, or any other species of *Acanthiza*, appropriating the disused nest of another bird.

The nest figured on the preceding page, was taken by Mr. S. W. Moore at Eastwood, thirteen miles north of Sydney, on the 1st November, 1902. It is almost globular in form, with a rounded entrance near the top; externally it is formed of strips of dead greyish-white bark matted up and held together with cobwebs and egg-bags of spiders; the inside being lined with reddish bark-fibre, fine grasses, and feathers. Externally it averages four inches and a quarter in length by three inches and three-quarters in diameter, and across the entrance one inch and a quarter. It was built in a low shrubby tree, about eight feet from the ground, and contained two fresh eggs.

The eggs are usually three in number for a sitting, oval in form, the shell being close-grained and slightly lustrous. Typically they are white, some specimens being tinged with buff, finely freckled with dull red, pale reddish-brown, and in rare instances faint purplish-red. The markings as a rule predominate on the larger end, where a small zone or cap is formed. A set now before me have small pale brownish-red caps only on the thicker end, and are otherwise destitute of markings. A set of three, taken from a nest built in a dwarf *Leptospermum*, at Frankston, Victoria, measures: Length (A) 0.65×0.5 inches; (B) 0.65×0.47 inches; (C) 0.64×0.48 inches. A set of two, taken at Woonona, New South Wales, measures: (A) 0.65×0.48 inches; (B) 0.72×0.5 inches. A set of three, taken at Roseville on the 1st September, 1900, measures: (A) 0.63×0.47 inches; (B) 0.62×0.5 inches; (C) 0.63×0.47 inches.

Nidification in the neighbourhood of Sydney usually commences about the middle of June, the species being one of the earliest breeders, but nests with eggs are more often found at the end of July or early in August. Two, if not three, broods are probably reared during the season, for nests with young may be found from early in August to the middle of December.

This species is very often the foster parent of *Lamprococyx flagosus* and *L. basalis*, and not infrequently *Cacomantis flabelliformis*. Mr. D. Swift found a nest on the 31st August, 1893, built in a dwarf *Melaleuca* on the Woolli Creek, containing two eggs of *Acanthiza fusilla*, and an egg each of *Lamprococyx flagosus*, *L. basalis*, and *Cacomantis flabelliformis*. This unusual set of eggs I exhibited at a meeting of the Linnean Society of New South Wales. Another nest I examined on the 13th September, 1893, built in the near vicinity where the previous one was taken, contained a single egg of *Cacomantis flabelliformis*, but on visiting it the following day the egg was missing and an egg of *Lamprococyx basalis* found in its place. All species of Cuckoos frequenting the neighbourhood of Sydney were unusually abundant that season.

An adult female, procured by Mr. F. R. Zietz in October, 1901, at Queenscliff, on Kangaroo Island, appears to be an insular form, intermediate between *Acanthiza fusilla* and *A. apicalis*. From typical examples of *A. fusilla* it may be distinguished by the ashy shade of the upper parts, which are also less distinctly washed with olive-green, duller coloured rump and upper tail-coverts, slightly darker wings, and by the sides of the neck being ashy-brown. Total

length 3·7 inches, wing 1·8, tail 1·6, bill 0·32, tarsus 0·75. I purpose to distinguish it as *Acanthiza dietzi*, after its discoverer, should the characters here given prove constant in the birds from this island. Probably referable to this form is a set of eggs sent me by Mr. W. White, together with the following note:—"The eggs of *Acanthiza apicalis* I am sending you I took on Kangaroo Island, from a moderately neat domed nest, formed of fine grasses interwoven with small strips of bark on the outside, and lined with finer grasses, the soft parts of various flowers, a few feathers, and a large quantity of thistle-down. This nest was built in a low shrub not more than two feet high, growing in a valley running up from American River, on the western side of the island. It contained only one egg when I first found it, but it had the full complement two days after. Another nest I found built in a tea-tree about six feet from the ground, was externally formed of strips of tea-tree bark, intermingled with a very little grass, and lined principally with feathers, contained three fresh eggs. On the same day I found another nest with three young ones, in which cobwebs were largely used in its outer construction." The eggs taken by Mr. White are similar to those of typical examples of *A. pusilla*, being oval in form and of a dull white ground colour, which is sprinkled over with freckles and dots of dull red particularly on the larger end, where in two specimens the markings coalesce and form irregular zones. They measure:—Length (A) 0·62 × 0·48 inches; (B) 0·63 × 0·49 inches; (C) 0·62 × 0·48 inches.

Acanthiza apicalis.

WESTERN THORN-BILL.

Acanthiza apicalis, Gould, Proc. Zool. Soc., 1847, p. 31; *id.*, Bds. Austr., fol., Vol. III., pl. 57 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 368 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII, p. 296 (1883).

ADULT MALE—*General colour above olive-brown; upper wing-coverts like the back, the greater series with dusky centres; quills dusky brown, externally edged with ashy-olive, narrower and lighter on the primaries; rump like the back but of a slightly clearer olive; upper tail-coverts dull rufous-brown; tail feathers ashy-brown narrowly margined externally with olive and crossed with a subterminal black band, less distinct on the central pair and having an irregular-shaped spot of white extending about half-way across the tip of the inner web and as far down the feather as the black band; lores and feathers around the eye dull white; forehead blackish with pale rufous tips to the feathers; chin, cheeks, throat, and fore-neck dull white with dusky-grey bases and narrow blackish edges to the sides of all the feathers, giving these parts a distinctly mottled appearance; centre of the lower breast and abdomen dull white; sides of the body, flanks, and under tail coverts pale fulvous. Total length $\frac{1}{2}$ inches, wing 2, tail 1·8, bill 0·3, tarsus 0·8.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Western Australia.

THE present species bears a strong resemblance to *Acanthiza pusilla* of Eastern Australia, but may be distinguished by its olive-brown upper parts, slightly deeper coloured upper tail-coverts, pale fulvous flanks, and principally by the spot of white at the tip of the inner web of the tail feathers. In some adult specimens, collected by Mr. George Masters at King George's Sound, Western Australia, in October, 1868, the tail feathers are much abraded, duller in colour, and the white spot at the tip of the inner web almost obsolete; the tips of the feathers, too, on the forehead are whitish instead of pale rufous. The latter character does not appear to be due to either age or sex, and I have also seen it in perfectly plumaged individuals. Mr. Masters, who collected a number of examples at King George's Sound, informs me that it does not differ in habits from *A. pusilla*, and that most of his specimens were collected in the thick undergrowth near the coast.

A nest of this species in the South Australian Museum, Adelaide, taken by Mr. Edwin Ashby at Kanoona, Western Australia, on the 2nd September, 1899, is attached to the stems of a low bush, and was built near the ground. It is oval in form with an entrance in the side, and more neatly made than typical nests of *Acanthiza pusilla*. Outwardly it is constructed of fine soft dried grasses, matted together with spider's webs and egg-bags, and lined inside with feathers. It averages nearly four inches in length by three inches in breadth, and across the entrance one inch and a quarter. Mr. W. D. Campbell, of the Geological Survey of Western Australia, sent two nests of this species to the Australian Museum, that he obtained near his camp at Menzies, Western Australia. Both were built close to one another in drooping leafy twigs of a thickly foliaged tree, and presumably by the same pair of birds. They are outwardly formed of very fine dried grasses, flowering plant stems, cobwebs, bits of string, and cotton, and lined inside with feathers.

The eggs are three in number for a sitting, oval in form, the shell being close-grained, smooth, and lustreless. They are white, with minute freckles and dots varying from dull red to pinkish and faint chestnut-red, distributed over the shell, but usually predominating on the thicker end, where the markings are slightly larger and darker, and in some instances form an irregular-shaped cap or zone. A set of three, taken near Perth, Western Australia, measures:—Length (A) 0.59 × 0.47 inches; (B) 0.62 × 0.48 inches; (C) 0.64 × 0.5 inches.

***Acanthiza diemenensis*.**

TASMANIAN THORN-BILL

Acanthiza diemenensis, Gould, Proc. Zool. Soc., 1837, p. 146; *id.*, Bds. Austr., fol., Vol. III., pl. 51 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 365 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 295 (1883).

ADULT MALE—*General colour above olive-brown, slightly tinged with dull green; upper wing-coverts like the back, the greater series with dusky centres; quills dusky brown, externally edged with olive-brown; upper tail-coverts pale olive-rufous; tail feathers ash-brown, broadly edged with pale olive-rufous at the base and crossed with a distinct subterminal black band except on the central pair; extreme edge of the tips of the lateral feathers white; forehead pale rufous-brown with narrow blackish edges to most of the feathers; ear-coverts olive-brown with whitish shaft-streaks; chin, throat, and fore-neck greyish-white, with dusky grey bases to all the feathers, giving these parts a mottled appearance; centre of the breast and abdomen dull white tinged with fulvous; sides of the breast pale fulvous, becoming slightly darker or fulvous-brown on the flanks; under tail-coverts pale fulvous; bill blackish-brown; legs and feet dark brown; iris reddish-brown. Total length 4 inches, wing 2.1, tail 1.7, bill 0.35, tarsus 0.8.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Tasmania.

THIS bird, generally known to the residents of Tasmania as the "Brown tail," is closely allied to *Acanthiza pusilla* of the Australian continent. Typically it may be distinguished by its slightly richer coloured upper tail-coverts, darker flanks, and larger size, the wing-measurement of adult males varying from 2 to 2.3 inches. I have, however, before me examples of *A. pusilla*, obtained in the Blue Mountains, New South Wales, and have seen others that were procured in the southern parts of Victoria that can hardly be distinguished from specimens of *A. diemenensis* procured in Tasmania. The difference in colour of the upper parts, shown in Gould's figures of *A. pusilla* and *A. diemenensis*, in his "Birds of Australia,"³ is not apparent in a large series of these birds in the Reference Collection.

³ Bds. Austr., fol. Vol. iii., pls. 53-54 (1848).

From Dr. L. Holden's MS. notes, made while resident at Circular Head, on the north-western coast of Tasmania, the following information is extracted:—"I found a nest of *Acanthiza diemenensis* on the 20th October, 1886, hanging from the twigs of a dwarf tea-tree, surrounded with reedy grass, and about two feet from the ground. It was a small domed nest, with an entrance near the top, and was made of dry grass and soft bark, lined with hair, feathers, and a little moss, and contained three fresh eggs. On the 21st September, 1888, I found another, with four slightly incubated eggs, built about four feet from the ground, in a clump of weeds over-running a *Mimosa*. It was built of dry grass to imitate the wreaths of old weed and was thickly lined with hair and feathers. The bird sat close, and both came very near while the nest was being taken. Companies of these birds, associated with Blue Wrens, are numerous in the scrub on Seven Mile Beach during April."

At Bellerive, near Hobart, on the 15th September, 1901, Dr. Holden found a nest containing young. It was placed on the ground among grass-stems, between a shoot and the stem of a pear-tree in a field adjoining his house.

A nest taken by Mr. R. N. Atkinson at Mount Bischoff, is elongate-oval in form, and outwardly consists of very thin dried strips of bark, and is lined with feathers of the Yellow-bellied Parrakeet. It measures externally seven inches in height by four inches in width; across the entrance one inch and a quarter, and was built in a low shrub near the ground.

The eggs are usually three or four in number for a sitting, oval or rounded oval in form, some specimens being rather pointed at the larger end, the shell being close-grained, smooth, and slightly lustrous. They are white with freckles or small irregular-shaped spots, varying from light red to pinkish and pale purplish-red, distributed in some instances over the shell, in others principally or entirely confined to the larger end, where they frequently assume the form of a more or less well defined zone. Three eggs of a set of four, taken at Circular Head by Dr. L. Holden on the 27th September, 1888, measure as follows: Length (A) 0.7×0.5 inches; (B) 0.69×0.51 inches; (C) 0.7×0.58 inches.

August and the four following months constitute the usual breeding season of the Tasmanian Thorn-bill.

***Acanthiza ewingi*.**

EWING'S THORN-BILL.

Acanthiza ewingii, Gould, Bds. Austr., fol., Vol. III., pl. 55 (1848).

Acanthiza ewingi, North, Proc. Linn. Soc. N.S.W., 30th March (1904).

ADULT MALE—*General colour above brown washed with dull greenish-olive, more distinctly on the lower back and rump; upper tail-coverts rufescent-olive; lesser and median upper wing-coverts like the back, the greater coverts blackish margined on their outer webs and tipped with dull greenish-olive; primary-coverts blackish; bastard wing blackish, the outer feathers indistinctly edged with dull greenish-olive; quills dark brown, the primaries externally margined at the base of their outer webs with light rufescent-olive which gradually passes into greenish-olive towards the tips, the secondaries externally margined with greenish-olive, the outermost series with blackish margins towards the base; tail feathers light dusky brown, externally margined with rufescent-olive darker at the base, narrower and lighter towards the tips, and crossed with a distinct subterminal band of black; extreme edge of the tips of the inner webs of the lateral feathers white; ear-coverts dull olive-brown; chin, cheeks, throat, and fore-neck grey; remainder of the under surface dull white faintly tinged with greenish-olive, which gradually becomes darker on the lower portion of the abdomen and flanks; under tail-coverts white faintly tinged with greenish-olive; thighs dull brownish-white washed*

with olive; under wing-coverts and edge of the wing white; "bill dark brown; legs and feet dark greyish-brown; iris rich reddish-brown;" (Atkinson). Total length in the flesh 4.5 inches, wing 2.15, tail 1.9, bill 0.45, tarsus 0.9.

ADULT FEMALE—*Similar in plumage to the male.*

Distribution. Tasmania.

THE present species appears to be generally distributed throughout the humid mountain ranges of Tasmania. Specimens were received in the flesh in March, 1902, also of *Acanthiza lineata*, that were procured at Waratah. Mount Bischoff, also the nests and eggs of these species. Examples have also been forwarded to me for examination, collected by Mr. F. R. Zietz, at the foot of Mount Wellington, near Hobart, where Mr. Zietz informs me the present species seems to be fairly common. There is also an adult female of *A. collingi* in the Australian Museum Reference Collection, received in July, 1876, obtained by Mr. K. Broadbent near Georgetown, thirty-seven miles north-west of Launceston.

Acanthiza collingi is allied to *A. diemenensis*, and although averaging about the same wing-measurement, the former species has a distinctly longer tail and tarsus. In colour *A. collingi* may be at once distinguished by the darker upper surface, throat, and fore-neck, and by having the abdomen and flanks a dull or dusky greenish-olive, of which the latter parts are pale fulvous in *A. diemenensis*. The forehead, too, is light rufous, and has not the scaled appearance of its ally; the primary coverts and spurious wing are blackish, and the basal portion of the outer webs of most of the primaries are light rufescent olive. The wing-measurement of adult specimens now before me of *Acanthiza diemenensis* varies from 2.05 to 2.23 inches, and of the tail from 1.7 to 1.8 inches. The wing-measurement of adult specimens of *A. collingi* varies from 2.12 to 2.23 inches, and of the tails from 1.88 to 1.95 inches. Gould, who originally described and figured *Acanthiza collingi* in his folio edition of the "Birds of Australia," pointed out the principal differences between *A. diemenensis* and *A. collingi*, but in his "Handbook"† places the latter species as a synonym of *A. diemenensis*, without making any further reference to it.

A nest of this species, taken by Mr. R. N. Atkinson, at Waratah, on the 22nd November, 1899, is a neat domed-shaped structure having a rounded entrance in the side. Externally it is formed of thin strips of bark-fibre and thickly coated with bright green moss, the inside being lined with the rich brown flossy covering of freshly budded fern-fronds and a thick layer of feathers, those of the Yellow-bellied Parrakeet predominating, as in most nests in which feathers are used as a lining material in this locality. Average external measurements four inches and a half in height by three inches in diameter, and across the entrance one inch and a quarter. "It was placed in a slender shrub growing near the end of a log, and contained three heavily incubated eggs." This nest resembles very much in form a typical one of *Acanthiza nana*, and is far smaller and more symmetrical than that of its ally *A. diemenensis*.

The eggs from the above nest are rounded ovals in form, and taper somewhat abruptly towards the smaller end, the shell being close-grained, smooth, and fairly lustrous. They are pure white, with distinct zones on the larger ends, formed of small confluent spots, streaks, and flecks of different shades of purplish-red, a few similar markings being sparingly distributed over the remainder of the shell, except on one specimen, which has a lengthened streak of confluent spots towards the smaller end. Length (A) 0.68 × 0.52 inches; (B) 0.67 × 0.52 inches; (C) 0.69 × 0.5 inches. Two eggs in the collection of Mr. Charles French, Junr., received from Mr. E. D. Atkinson, and taken by Mr. G. F. Hinsby on Mount Wellington, near Hobart, measure alike 0.67 × 0.49 inches.

* Bds. Austr., fol. Vol. iii., pl. 55 (1848).

† Handbk. Bds. Austr., Vol. i., p. 365 (1865).

Acanthiza pyrrhopygia.

RUFIOUS-RUMPED THORN-BILL.

Acanthiza pyrrhopygia, Gould, Bds. Austr., fol., Vol. III., pl. 58 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 369 (1865).

ADULT MALE—*General colour above pale olive-brown: upper wing-coverts like the back: quills dusky brown, the primaries externally edged with ashy-olive, the secondaries margined with olive-brown: upper tail-coverts rufous: basal portion of tail feathers very pale reddish-olive externally margined with rufous, the apical portion blackish-brown, largely tipped with white on the inner web and very pale olive-brown on the outer, the lateral feathers also narrowly edged with white on the tips of their outer webs: forehead blackish-brown with distinct whitish tips to all the feathers: ear-coverts dull whitish with blackish-brown bases: chin, cheeks, throat and fore-neck dull white with dusky-grey bases and blackish margins to the sides of all the feathers, giving these parts a distinctly mottled appearance: sides of the breast ashy-brown: remainder of the under surface white washed with fulvous on the flanks: under tail-coverts fulvous: bill blackish-brown: legs and feet brown: iris reddish-brown. Total length $\frac{1}{4}$ inches, wing 2, tail 1.75, bill 0.55, tarsus 0.75.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—South Australia, Victoria, New South Wales.

THE Rufous-rumped Thorn-bill, an inhabitant of the south-eastern portion of the continent, is found in South Australia and North-western Victoria. Gould, who discovered this species in the belts of the Murray River, describes and figures it in his folio edition of the "Birds of Australia," and points out where it differs from *Acanthiza apicalis* of Western Australia. Dr. Sharpe, who had apparently never seen an example of *A. pyrrhopygia*, for he transcribes Gould's description of it in his "Catalogue of Birds in the British Museum,"¹ regards it as "very doubtfully distinct from *A. apicalis*," and erroneously gives its habitat as Western Australia. I feel sure, however, if Dr. Sharpe had seen a specimen he would never for a moment question the validity of *A. pyrrhopygia*. Its very pronounced rufous upper tail-coverts, and more conspicuously white tipped tail feathers which have also a broader blackish-brown subterminal band, will readily serve to distinguish it from *A. apicalis*. Wing-measurement of adult males varies from 1.9 to 2 inches.

A specimen lent by the South Australian Museum, procured by Mr. R. M. Hawker, in April, 1902, in the scrubs of the Murray River, South Australia, where Gould procured the type, is altogether darker than New South Wales examples, and is furthermore distinguished by having the under tail-coverts fulvous. Gould does not give the colour of the latter, but states that the flanks are pale buff. An adult female, and young male, since received, collected by Dr. A. M. Morgan and Dr. A. Chenery respectively, at Paney and Nonning, during a trip made from Port Augusta to the Gawler Ranges in August, 1902, have the same fulvous-washed flanks and fulvous under tail-coverts, but these parts are naturally paler in the young male. A similar-coloured adult bird is in the Australian Museum collection; it was obtained by Mr. R. H. Palleine on Yorke Peninsula.

The nest, an oval structure with an entrance near the top, is outwardly formed of strips of bark, wool, dried grasses, and spider's cocoons, all matted together, and lined inside with feathers or other soft material. It is generally placed in the drooping leaves of a eucalyptus, or acacia.

The eggs are three in number for a sitting, oval in form, the shell being close-grained, smooth, and slightly lustrous. They are of a fleshy-white ground colour, which is thickly

¹ Bds. Austr., fol., Vol. iii., pl. 58 (1848).

² Cat. Bds. Brit. Mus., Vol. vii., p. 297 (1883).

freckled, particularly on the larger end with reddish-chestnut or reddish-brown, where the markings form a well defined cap or zone. A set of three, taken in the Wimmera District, Victoria, measure:—Length (A) 0·63 × 0·47 inches: (B) 0·64 × 0·48 inches: (C) 0·65 × 0·48 inches.

In South Australia, Dr. A. M. Morgan informs me that he observed only two or three of these birds about Laura, but he has a set of three eggs in his collection, taken in that locality by the late Mr. Malcolm Murray on the 26th July, 1868.

In Western New South Wales, Mr. James Ramsay procured two nests and sets of eggs at Tyndarie, in 1870, and there is a fine old adult male in the Australian Museum collection, obtained by Mr. Hearn, near Dubbo. I procured an adult male at West Narrabri in November, 1866, where I found it by no means uncommon in the brigalow scrubs, but never met with it in the adjacent open forest-lands in the neighbourhood of the Namoi River, or on the lightly timbered plains. In habits it closely resembles *A. pusilla* and other scrub frequenting species, and the red colouring of the rump shows very conspicuously some distance away, especially during flight. The stomach of the specimen I obtained contained the remains of minute insects.

All the examples now before me of the so-called *Acanthiza pyrrhopygia* procured in New South Wales, may be readily distinguished from specimens obtained in South Australia by their larger size, rufous-chestnut upper tail-coverts, lighter under surface which have only a slight tinge of fulvous on the flanks, and by their white under tail-coverts. The adult male procured near Dubbo measures:—Total length 1·1 inches, wing 0·22, tail 1·0, bill 0·38, tarsus 0·0. I purpose to distinguish this form under the name of *Acanthiza albiventris*, the White-vented Thorn-bill.

A set of three eggs, taken by Mr. James Ramsay at Tyndarie, Western New South Wales, in October, 1878, are oval in form, the shell being close-grained, smooth, and lustreless. They are pure white, with a few pinkish-red dots and spots on the larger end, distributed in the form of a zone: the remainder of the shell being devoid of markings: Length (A) 0·67 × 0·47 inches: (B) 0·67 × 0·5 inches: (C) 0·67 × 0·48 inches.

Acanthiza lineata.

STRIPED-CROWNED THORN-BILL.

Acanthiza lineata, Gould, Proc. Zool. Soc., 1837, p. 116; *id.*, Bds. Austr., fol., Vol. III., pl. 61 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 372 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 297 (1883).

ADULT MALE—*General colour above dull olive slightly brighter on the lower back and rump; upper wing-coverts dusky-brown, indistinctly margined with olive-green; quills dusky brown, narrowly edged with olive-green, broader on the innermost secondaries; upper tail-coverts dull olive-brown; tail feathers ashy-brown, narrowly margined externally with olive-green and crossed by a subterminal black band, decreasing in width towards the central pair which have only a spot of black in the centre; head olive-brown, darker on the forehead, all the feathers having narrow white shaft-lines; lores and centres of the feathers above the eye dull white; feathers below the eye and the ear-coverts dull white with dusky margins; chin, throat, and fore-neck dull white with narrow blackish margins to the sides of the feathers; remainder of the under surface dull yellowish-white, the sides of the body darker and distinctly washed with olive; under tail-coverts pale fulvous yellow; bill dark brown; legs and feet greyish-brown; iris dull grey. Total length in the flesh $\frac{1}{2}$ inches, wing 2, tail 1·6, bill 0·3, tarsus 0·68.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Queensland, New South Wales, Victoria, South Australia.

THE present species is freely distributed throughout the coastal scrubs and contiguous mountain ranges of south-eastern Australia. It evinces a decided preference for low gum sapling scrubs growing in humid localities, and is not met with in the dry inland portions of the States.

Specimens from the Mount Lofty Ranges, near Adelaide, where Dr. A. M. Morgan and Mr. A. Zietz inform me this species is very common, are richer and darker in colour, especially on the under-surface, than examples obtained in New South Wales, where the type was obtained. The wing-measurement of adult males from different localities varies from 1.9 to 2.1 inches.

About Middle Harbour, Sydney, and the highlands of the Milson's Point railway-line, it is usually met with during the autumn and winter months in small flocks from five to seven or more in number, minutely examining the leaves and crevices in the stems of saplings for insects and their larvæ, which constitute their sole food. The bills of birds of this genus are



STRIPED-CROWNED THORN-BILL.

well adapted for prying into the smallest recesses, and I have often watched this species extract the larvæ of insects from what a few feet away looked like a closely-fitting and perfectly glabrous bark. Fruit-trees, vines, and cultivated shrubs are also carefully scrutinized for food by these active little birds, whose presence is often betrayed by their somewhat monotonous "chip, chip," which is continuously uttered as they are engaged in their search among the leaves or stems for insects. Both in the bush, in orchards, and gardens these birds are very tame and fearless; they should, however, be zealously protected by orchardists and viticulturists, for they do no harm, but materially assist in reducing the number of insect pests which infest fruit-trees and vines. To gardeners also they are invaluable, for they rid many shrubs and plants of blight, although in this respect they pay more attention to the indigenous than

the acclimatised flora. There is nothing in the actions of *Acanthiza lineata* to distinguish it from *A. pusilla*, excepting that it is more arboreal in habits.

The nests are oval or pear-shaped in form, with a rounded spout-like entrance towards the top. Outwardly they are formed of shreds or fine strips of stringy-bark, intermingled with a few fine grasses and a large quantity of spiders' web and cocoons, firmly matted and woven together; the inner wall and bottom of the structure, which is usually very thick, being composed wholly of soft inner bark fibre, and the inside thickly lined with feathers, cow-hair, or the silky down from the pods of the introduced cotton-plant. Most of the nests I have examined which have been built near dwellings have been lined with fowls' feathers. Some are more neatly made than others, and are thickly coated with spiders' webs and egg-bags, others have a reddish-hue from their being formed chiefly of stringy-bark, while occasionally they are ornamented with soft pieces of white paper-like bark of a *Melaleuca*. Green moss, although it is sometimes used, does not enter so largely into the construction of the nests of this species as it does in those of *Acanthiza nana*. One now before me has several pieces of string and a small strip of white linen worked into the outer wall. An average nest measures four inches in length by three inches in diameter at its widest part, and one inch across the entrance. They are usually firmly attached at the top to a thin horizontal or slanting leafy branch, and for preference that of a gum sapling, at a height usually from ten to twenty feet from the ground; occasionally they are placed within hand's reach, but never on the ground.

As with the nests of other species of this genus, the rounded spout-like or hooded entrance to the structure is larger when it contains young than when the eggs are first deposited.

The eggs are usually three in number for a sitting, elongate-oval in form, the shell being close-grained, smooth, and lustreless. They vary in ground colour from a pinkish-white to a pale creamy-buff, and are more or less distinctly zoned on the larger end with minute freckles or small irregular-shaped dots and streaks, varying from pinkish-red to dull chestnut and brownish-red, and sparingly marked with the same colour over the remainder of the shell. Typically the eggs of this species may be distinguished from those of any other of the genus by their elongated form and the markings being congregated principally in the form of a distinct zone on the larger end. Some eggs are remarkably long, and compressed at the smaller end. A set of two of this type, taken by me at Trafalgar, South Gippsland, Victoria, in September, 1883, measures as follows:—Length (A) 0.75 × 0.47 inches; (B) 0.73 × 0.47 inches. An egg of the Rufous-tailed Bronze Cuckoo (*Lamprolaima basalis*) was also deposited in the same nest. A set of three, which I took at Springwood, on the Blue Mountains, in September, 1895, measures:—(A) 0.69 × 0.48 inches; (B) 0.68 × 0.49 inches; (C) 0.66 × 0.48 inches.

Fledgelings resemble the adults, but they are slightly duller in colour and the crown of the head is less distinctly streaked.

The breeding season commences in July, and continues until the end of December, during which time two or more broods are reared. At Roseville I saw a half-built nest which the birds were engaged in constructing in a low gum sapling on the 28th July, 1898. During the following month, four nests that I examined in the district contained newly hatched young.

Near Dulceen, on the highlands of the Darling Downs, Southern Queensland, Dr. A. M. Morgan and his brother, Mr. E. R. Morgan, found three nests of this species during September, 1903. All were built in the drooping leafy twigs of a species of *Angophora*, at a height of about twenty feet from the ground. One contained two fresh eggs, another three eggs heavily incubated; and the third, on which the bird was sitting, was built in so inaccessible a position that it could not be closely examined.

The eggs of the Bronze Cuckoo (*Lamprolaima phlegosus*) and those of the Rufous-tailed Bronze Cuckoo (*L. basalis*) are often deposited in the nests of this species.

Acanthiza mastersi.

MASTERS' THORN-BILL.

Acanthiza mastersi, North, Agric. Gaz. N.S.W., Vol. XII., p. 1125 (1901).

Acanthiza inornata, (note), Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 293 (1883); North, Proc. Linn. Soc. N.S.W., 2nd ser., Vol. II., p. 496 (1887).

ADULT MALE—General colour above dark brown, slightly tinged with olive; upper wing-coverts like the back, the larger series with indistinct dusky centres; quills dark brown externally washed with olive, paler on the edges of the outer primaries; rump and upper tail-coverts clear olive-brown; base of the tail feathers dull reddish-brown margined with olive, the apical portion brown crossed with a distinct sub-terminal blackish band which is almost lost on the central pair; tips of the inner webs of the lateral feathers paler and inclining to buffy-brown; forehead dark brown, with pale brown edges to the feathers, giving this part a scaly appearance; ear-coverts fulvous-brown, with indistinct paler shaft-lines; chin, cheeks, sides of the neck and all the under surface pale fulvous; the feathers on the abdomen, flanks, and under tail-coverts slightly darker and indistinctly tinged with olive; bill dark brown; legs and feet dark brown. Total length 3.5 inches, wing 1.85, tail 1.5, bill 0.38, tarsus 0.7.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Western Australia.

WHEN comparing examples of *Acanthiza inornata*, obtained in the neighbourhood of Perth, Western Australia, with others labelled as such in the Reference Collection of the Australian Museum, I observed that the latter, although closely allied, were quite distinct from the Perth specimens and Gould's original figure and description of *A. inornata*. Upon referring to the "Catalogue of Birds in the British Museum," I found that Dr. Sharpe in a foot-note to his description of *Acanthiza inornata*, had also noted the difference in colour between the King George's Sound and Swan River birds. The birds from the former locality I have distinguished as *Acanthiza mastersi*, after Mr. George Masters, Curator of the Macleay Museum of the University of Sydney, who, while collecting at King George's Sound in October and November, 1868, on behalf of the Trustees of the Australian Museum, obtained several specimens, likewise the nest and eggs. The darker upper and under surface will always serve to distinguish *A. mastersi* from its near ally *A. inornata*.

A nest of this species in the Australian Museum collection, taken on the 3rd December, 1868, is a dome-shaped structure, with an entrance near the top, and is composed of the dried wiry stems of a *Proscia*, fine strips of bark, and the downy buds from *Banksia* cones, matted together with spider's webs and egg-bags, and lined inside with soft silky-white seeds of some composite plant. It measures exteriorly four inches and a quarter in height by three inches in width: the aperture, which is oval and near the top, being one inch in height, and one inch and a quarter in breadth. The nest is not suspended, but firmly packed between and at the junction of several nearly upright branches of a *Banksia*, and was about five feet from the ground. It contained two eggs, which are oval in form and of a fleshy-white ground colour, freckled all over with irregular-shaped markings of reddish-brown, particularly towards the larger end, where they become confluent and form a well defined zone:—Length (A) 0.7 × 0.52 inches: (B) 0.69 × 0.52 inches.

Acanthiza uropygialis.

CHESTNUT-RUMPED THORN-BILL.

Acanthiza uropygialis, Gould, Proc. Zool. Soc., 1837, p. 146; *id.*, Bds. Austr., fol., Vol. III., pl. 56 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 367 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 298 (1883).

ADULT MALE—*General colour above brown slightly tinged with olive: upper wing-coverts like the back, the greater series with dusky brown centres; quills dusky-brown, the primaries having externally narrow indistinct whitish edges, and the secondaries pale brown margins becoming almost white around the tips of the inner series: upper tail-coverts and basal portion of the tail feathers chestnut, the apical half of the latter black distinctly tipped with white on the inner web and very pale brown on the outer web, these tips decreasing in size towards the central pair: head like the back but with a distinct rufescent shade on the snipeut; forehead blackish-brown, the feathers having whitish margins; feathers below the eye and the ear-coverts ashy-white with brown bases and centres, giving these parts a mottled appearance: all the under surface ashy-white, being of a slightly purer white on the chin and centre of the abdomen, the flanks faintly tinged with fulvous; thighs brown; under tail-coverts white: "bill dark brown; legs and feet blackish; iris white;" (Bennett) Total length 3.6 inches, wing 2.1, tail 1.5, bill 0.35, tarsus 0.65.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Queensland, New South Wales, Victoria, South Australia, Western Australia, North-western Australia.

* Cat. Bds. Brit. Mus., Vol. vii., p. 293 (1883).

GOULD, who described this species in 1837 from examples obtained in New South Wales, had up to the time of the publication of his "Handbook to the Birds of Australia," gained no information as to its habits and economy, or even the particular haunts it frequented. The late Mr. R. H. Nancarrow contributed a very interesting account of finding it breeding in the Whipstick Scrub, near Bendigo, Victoria, in October, 1881. The late Mr. K. H. Bennett obtained several specimens at Moolah, in the Western District of New South Wales, in August, 1883, and later on at Mossiel, where he found it breeding in 1886. In his MS. notes, made in the latter district, he remarks: "*Acanthiza lineifrons* is the only species of the genus that I have noticed in this part of the colony. It is tolerably abundant in the back country, associating in small flocks of about six or eight individuals. The nest is dome-shaped, very like that of the *Malurus*, and is composed of soft dried grasses and bark fibre, neatly lined with feathers or fur. It is almost always placed in a hollow limb or trunk of some small tree, and three eggs are usually laid for a sitting. I have found nests containing eggs from September to December." There is also a specimen in the Reference Collection obtained by Mr. Robert Grant at Byrock, New South Wales.

Mr. Edwin Ashby sent me a specimen for examination that he had shot at Murchard, South Australia, in November, 1901; also others that he had procured at Callion, and Siberia Soak, Western Australia. From Point Cloates, North-western Australia, Mr. Tom Carter sent me a specimen for identification, and later on wrote as follows: "*Acanthiza lineifrons* is not uncommon inland in scrubs, and also in the upper boughs of white gums. They go in small flocks, and utter a tinkling note."

Dr. A. M. Morgan writes me: "*Acanthiza lineifrons* is a very common bird in the mulga scrubs to the north-west of Port Augusta, in South Australia. It was usually seen in small flocks from eight to ten in number, they were very tame and could almost be caught by the hand. I found a pair breeding on the 30th July, 1900. The nest was built in the mud wall of a cook-house, within a few feet of an occupied house. A small space had been left beside one of the strengthening upright posts, and in this cavity the nest was placed. Beyond the fact that the nest was lined with feathers, I could not say how it was built, as it could not be examined without breaking down the wall, a proceeding to which the owner objected; I however managed to extract one fresh egg." Again, in company with Dr. A. Chenery, this species was found common in eucalypti, myall, and mulga country during a trip made to the Gawler Ranges from Port Augusta in 1902, "a nest half-formed being found on the 8th August, near Scrubby Hill, in the top of a hollow stump, giving the top of the stump a rounded appearance."

A nest now before me, taken by the late Mr. K. H. Bennett, is oval in form with a rounded entrance near the top, and is constructed externally of dried grasses, strips of bark, a few small thin herbaceous plant-stalks, and a little spiders' web; the inside being lined entirely with feathers. Externally it measures four inches in height by three inches in breadth, and across the entrance one inch and a quarter. It was placed in the hollow limb of a dead belar, about five feet from the ground, and contained three fresh eggs. In the places this species selects for a nesting-site, it resembles *Gedibulus reguloides*, and typically also *Xerophila leucopsis*, a cleft in a hollow limb being usually resorted to, and occasionally an aperture between two branches, or the upright stems of two trees growing close to each other, in a piece of hanging curled bark as noted by Mr. Nancarrow, and in the wall of a house by Dr. A. M. Morgan. The former also observed these birds breeding at a height of from two to ninety feet from the ground. Those found by the late Mr. K. H. Bennett were usually within ten feet and not at a higher altitude than twenty feet.

* Vict. Nat., Vol. iv., p. 206 (1888).

The eggs are three in number for a sitting, oval in form, the shell being close grained, smooth, and slightly lustrous. They are of a delicate fleshy white, and are usually minutely freckled all over with light reddish-brown, but particularly towards the larger end, where they form a more or less well defined zone. In one set now before me, the markings, consisting of a few scattered reddish-brown irregular-shaped spots, are confined entirely to the larger end. An egg in another set of two, has numerous but almost invisible freckles nearly uniformly distributed over the shell, while the other has the markings in the form of a distinct band of confluent spots on the thicker end. The latter set, taken at Mossgiel in September, 1886, measures as follows:—Length (A) 0.63×0.48 inches; (B) 0.63×0.5 inches. A set of three, taken in the same locality on the 15th October, 1886, measures:—(A) 0.65×0.5 inches; (B) 0.65×0.48 inches; (C) 0.66×0.48 inches.

Nidification with this, as with many other species in South Australia, begins earlier in that State than elsewhere, Dr. A. M. Morgan obtaining a nest with a fresh egg as early as the 20th July. Nests with fresh eggs, also young birds, were noted in Victoria by Mr. Nancarrow in October; while the late Mr. K. H. Bennett found nests with eggs in Western New South Wales from September to December.

Acanthiza tenuirostris.

SMALL-BILLED THORN-BILL

Acanthiza tenuirostris, Zietz, Trans. Roy. Soc. S.A., Vol. XXIV., p. 112 (1900); Sharpe, Hand-l. Bds., Vol. IV., p. 220 (1903).

ADULT MALE—*General colour above dull ashy-brown slightly washed with olive, which is more distinct on the lower back and rump: upper wing-coverts brown, the lesser series indistinctly tinged with olive, the median and greater series with paler brown margins: quills brown, the primaries narrowly edged with pale brown except the basal two-thirds of the outermost series which are ashy-white on their outer webs, the secondaries margined with pale brown of a slightly lighter shade; upper tail-coverts fulvous-white at the base, with an indistinct olive wash on their apical portion: tail feathers blackish-brown, ochraceous white at their extreme base, narrowly edged and tipped with pale brown, the inner webs of the lateral feathers having a white spot at the tip, increasing in size towards the outermost feather, which has the apical portion of the outer web white: forehead blackish-brown, all the feathers having broad whitish margins giving it a distinct scaled appearance: lores and feathers around the eye dull white washed with fulvous: cheeks and ear-coverts brownish-white, with small pale brown bases: throat, fore-neck, and upper breast dull ashy-white with a faint yellowish wash, the latter also slightly tinged with pale fulvous-brown: sides of the abdomen and lower flanks pale yellow slightly washed with olive: centre of the lower abdomen, the vent, and under tail-coverts yellowish-white: "bill black: legs and feet black: iris light yellow:" (Morgan). Total length 3.5 inches, wing 1.9, tail 1.5, bill 0.22, tarsus 0.65.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—South Australia, Western Australia.

THIS very distinct species was described by Mr. A. Zietz, the Assistant Director of the South Australian Museum, in the "Transactions of the Royal Society of South Australia." The types, kindly sent on loan by the Director, Dr. E. C. Stirling, F.R.S., in the following year, were obtained by Mr. R. M. Hawker on the 18th August, 1895, in the scrub at Leigh Creek, between Lake Torrens and Lake Frome, about three hundred and seventy-four miles north of Adelaide. With the specimens Mr. Zietz wrote as follows:—"My *Acanthiza tenuirostris* may possibly be, after all, only a diminutive form of *Acanthiza reguloides*, Vig. & Horsf.,

* Trans. Roy. Soc. S.A., Vol. xxiv., p. 112 (1900).

from which it is distinguished by its smaller size, the absence of the buff colouring on the rump, and it also lacks the pale buff bases to all the tail feathers, as described by Gould in his "Handbook to the Birds of Australia."

Acanthiza tenuirostris does bear a strong resemblance to *Geobasileus reguloides*, as pointed out by Mr. Zietz, that is in colour, but it is unquestionably a good and distinct species, not a small form of *G. reguloides*, nor has it any other near ally. It may be distinguished from all other species of *Acanthiza* by its almost uniform-coloured tail, pronouncedly light upper tail-coverts, and its small slender bill, which is comparatively narrow at the base, and has a tendency to recurvature. As I premised at the time, the nest when found would be built in a similar position to that of the typical *Acanthiza*, and not placed like that of *Geobasileus reguloides*.

During a trip made by Dr. A. M. Morgan and Dr. A. Chenery from Port Augusta to the Gawler Ranges in South Australia, an adult male was obtained on the 10th August, 1902. Relative to this specimen, Dr. Morgan writes: "A male of *Acanthiza tenuirostris* was shot in a salt-bush near Mount Ive Government tank. This is a salt-bush bird, and is exceedingly shy. Dr. Chenery took about twenty minutes stalking to procure the specimen. It dodged about in the salt-bush as if it were quite at home. There were no trees in the vicinity."

Writing recently, Mr. A. Zietz remarks: "I have received here for examination from the Perth Museum, an adult male of *Acanthiza tenuirostris*, procured at Day Dawn, Western Australia, on the 15th May, 1903."

By direction of the Curator of the Perth Museum, Mr. Bernard Woodward, F.G.S., I have received from Mr. C. P. Conigrave, a photograph taken by him of a nest of *Acanthiza tenuirostris* in that institution. It is a small domed structure, with a rounded entrance in the side, and is built in the lower leafy portion of a forked branch of a samphire bush. This nest, which contained young birds, was taken by Mr. C. F. Lawson, on the 1st August, 1903, at Day Dawn, a mining township on the Murchison goldfield, about four miles south-west of Cue, Western Australia. Up to the present the eggs of this species have not apparently been taken, but doubtless they will be found to closely resemble those of the smaller members of the genus *Acanthiza*.

Genus *GEOBASILEUS*, *Cabanis*.

Geobasileus chrysorrhous.

YELLOW-RUMPED THORN-BILL.

Saricola chrysorhoa, Quoy et Gaim., Voy. de l'Astrol., Zool., Tom. 1, p. 198, Atlas, pl. 10, fig. 2 (1839).

Acanthiza chrysorrhoa, Gould, Bds. Austr., fol., Vol. III., pl. 63 (1848).

Geobasileus chrysorrhous, Gould, Handbk. Bds. Austr., Vol. I., p. 374 (1865).

Acanthiza chrysorhoa, Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 298 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 220 (1903).

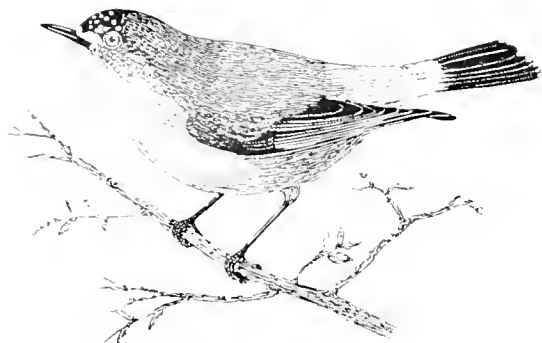
ADULT MALE—General colour above brown, washed with olive-yellow; upper wing-coverts like the back, and having dusky brown centres; quills dark brown, the primaries narrowly edged externally with ashy-white, and the secondaries margined with olive-brown; rump and upper tail-coverts bright yellow; tail feathers yellow at the base, blackish-brown on their apical half, with pale brown tips passing into white on the ends of the inner webs; forehead blackish, each feather having a spot of white at the tip; a narrow frontal line, lores, and a distinct eyebrow whitish; a small spot in front and another behind the eye blackish-brown; ear-coverts dull white narrowly edged with dark brown; chin and upper throat white; remainder of the under surface yellowish-white slightly tinged with buff, which is more pronounced on the sides of the body; under tail-coverts pale yellow; bill black;

legs and feet dark greyish-black; iris greyish white. Total length in the flesh 4.5 inches, wing 2.3, tail 1.6, bill 1.4, tarsus 0.7.

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Queensland, New South Wales, Victoria, South Australia, Central Australia, Western Australia, Tasmania.

THE present species was one of the novelties discovered by the French naturalists, MM. Quoy and Gaimard, during the "Voyage de l'Estrolabe" in Australian waters in 1826-29, under the command of Captain M. J. Dumont D'Urville. The precise locality where the type was obtained is not recorded in the original description, but, with the exception



YELLOW-RUMPED THORN-BILL.

of the extreme northern and north-western portions of the continent, it is distributed in favourable situations throughout most parts of Australia and Tasmania. It is usually met with in pairs or small flocks, according to the season, in open forest lands or where there is only a light undergrowth, as it passes a great portion of its time in search of insects on the ground. In the cooler parts of the States, hedge-divided pasture-lands are its favourite haunts, but it also frequents orchards and vineyards, and is found in most public parks and gardens, even in the centre

of large and busy cities. It is one of the most familiar and ever-trustful little birds which frequent the haunts of man; its sweet and varied notes, combined with its well-known insect destroying habits, rendering it a general favourite with everyone. When resorting to orchards and gardens, it may be seen busy amongst the branches of fruit trees or shrubs, exploring the twigs and buds, and ridding them of aphides and other insect pests. If disturbed, it rarely flies to any long distance, but merely flits from tree to tree, uttering at the same time a short but not unmusical "chip, chip." It is during flight that the brilliant colour of the rump and upper tail-coverts is displayed to advantage.

Specimens obtained by Mr. George Masters at King George's Sound, and by Mr. Edwin Ashby near Perth, Western Australia, have the crown of the head darker and the under surface paler than eastern examples. Specimens from Tasmania are larger and richer in colour; while those from Central Australia have that faded and washed-out appearance common to many species inhabiting hot and arid districts.

The nest is certainly unique as regards bird architecture in Australia. It is in reality a double nest, consisting of a dome-shaped structure, with a narrow entrance in the side, used by the female as a receptacle for her eggs and for the purposes of incubation; and on top of this edifice, a roughly formed open cup-shaped nest which is generally believed to be resorted to by the male at night. Outwardly it is formed of dried grasses, dead flowering plant stalks, cobwebs, spider's egg-bags, wool, or other soft material, all matted together; the inside of the domed lower portion being thickly lined with fine dried grass, cow-hair, opossum or rabbit fur, and feathers. About pastoral lands, wool is largely used both externally and internally in its construction. An average nest measures over all seven inches and a half in length, the domed portion of the structure measuring five inches in height by four inches and a quarter in breadth, and across the entrance one inch; the cup-like cavity on the top is two inches and a quarter in diameter by one inch and a half in depth. The nests, however, vary much in size, and I have seen them over a foot in length. A remarkable one I found, built in the bushy end of a drooping pine branch, in the Sydney Domain, on the 19th August, 1889, consisted

of the usual double structure, from which I flushed a bird on approaching it. The domed portion was well lined with feathers and apparently just ready for laying in. On making a further examination, I found an artfully concealed spout-like entrance leading to a second domed chamber built underneath the other, and containing three young ones. I found a similar structure at Enfield, near Sydney, on the 17th August, 1897, built in a *Hakea acicularis*, the cup-shaped cavity at the top being unusually neatly made and the entrance to the upper domed portion fairly conspicuous, while that of the under one was protected with a hood and well hidden. The lower domed cavity contained four fresh eggs. Usually the nest is built in the bushy end of a drooping branch, from three to six feet from the ground, but I saw one in a dwarf gum built within ten inches of the ground, and have observed them as high as thirty feet. Little or no preference is shown in the trees or shrubs selected as nesting-sites, but they are frequently constructed in tea-trees, gums, pines, and needle-bushes; about orchards and gardens prickly acacia, and other spine-covered hedge-plants, are chiefly resorted to as a protection from nest marauding boys and other enemies. Probably the nest of no other species stands so much in need of a protector; the fearless manner of the little owners in carrying material for its construction often indicates the place in which it is built. Its bulky size, too, when finished, generally renders it a conspicuous object, and it frequently falls an easy prey to the keen vision of bird-nesting boys. It is satisfactory to know, however, that several broods are still reared every year within a short distance of the Sydney Post Office. In common with several species, the Yellow-rumped Thorn-bill sometimes constructs its nest underneath the nest of a Magpie, Whistling Eagle, or Wedge-tailed Eagle. Near Bathurst, Mr. A. E. Ivatt informs me that he has found it underneath the nest of the Black-backed Magpie. On the 2nd August, 1900, at a place known as "The Birthday," ninety miles north-west of Port Augusta, South Australia, Dr. A. M. Morgan found a nest of the Wedge-tailed Eagle, in a myall, containing two incubated eggs, and underneath it a nest of *Gebusileus chrysorrhous*, but he did not examine the latter. At Port Augusta, twelve days later, he found a nest of a Whistling Eagle in a dead gum, with three newly hatched young, and attached to the sticks underneath a nest of *Gebusileus chrysorrhous* containing three fresh eggs.

The eggs are usually three, sometimes four in number for a sitting; their thin semi-transparent shells, when fresh, rendering them of a pale flesh colour, but when blown they are pure white. Occasionally sets are found with minute dots or flecks of pale red or reddish-brown, sprinkled over the larger end of the egg, which in rare instances assume the form of a more or less well defined zone. A set of three, taken at Ashfield, near Sydney, on the 8th February, 1891, measures:—Length (A) 0.72×0.52 inches; (B) 0.68×0.52 inches; (C) 0.71×0.51 inches. A set of four, taken at Enfield on the 17th August, 1897, measures:—Length (A) 0.71×0.5 inches; (B) 0.68×0.49 inches; (C) 0.71×0.5 inches; (D) 0.7×0.5 inches.

Fledgelings resemble the adults, but are duller in colour, the forehead is destitute of white spots, and there is a distinct buffy tinge to the feathers of the fore-neck.

In the neighbourhood of Sydney, the latter half of the year constitutes the usual breeding season; but, with the exception of June, I have found nests with eggs, or young, throughout the year. Nidification, in which both sexes take part, generally commences early in July, although I have found half completed nests at Roseville on the 1st of that month. A nest that I saw one of these birds lining with feathers in the Sydney Domain on the 14th August, I was surprised to find, ten days later, contained two incubated eggs on the point of hatching; another egg I discovered under the lining at the bottom of the nest was quite fresh. If a nest is removed, another is frequently built in the same situation. I took one from a pine at Ashfield, containing three fresh eggs, on the 8th February, 1891; and on the 14th September of the following year found another built in the same place, containing three young ones.

This species is often the foster-parent of the Bronze Cuckoo (*Lamprolaima plagusus*).

Geobasileus reguloides.

BUFF-RUMPED THORN-BILL.

Acanthiza reguloides, Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 226 (1826); Gould, Bds. Austr., fol., Vol. III., pl. 62 (1848); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 299 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 220 (1903).

Geobasileus reguloides, Gould, Handbk. Bds. Austr., Vol. I., p. 376 (1865).

ADULT MALE—*General colour above olive-brown, the lower back of a slightly brighter olive; upper wing-coverts like the back, the greater series with broad dusky brown centres; quills dusky brown, narrowly edged externally with olive; rump and upper tail-coverts ochraceous-yellow; basal half of the tail feathers pale ochraceous-buff, the apical half blackish-brown with pale ochraceous-brown tips which are lighter on the inner webs; forehead pale rufescent-brown with whitish margins to the feathers; remainder of the under surface pale ochraceous-yellow, slightly richer and brighter in colour on the flanks and abdomen; sides of the breast washed with olive-brown; under tail-coverts pale ochraceous-buff; bill dark greyish-brown at the tip, whitish at the base of the lower mandible; legs brownish-grey, the feet a slightly darker shade of grey; iris very pale bluish-white. Total length in the flesh 4.3 inches, wing 2.1, tail 1.6, bill 0.3, tarsus 0.7.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Queensland, New South Wales, Victoria, South Australia.

NEW SOUTH WALES is the stronghold of *Geobasileus reguloides*, the type of which, described by Messrs. Vigors and Horsfield, was obtained near Sydney. It is also found in Southern Queensland, and in much diminished numbers in some parts of Victoria and South Australia. It is abundantly distributed in the coastal districts of New South Wales and the contiguous mountain ranges, but I have never met with it or seen a specimen in any collection formed in the dry western portions of the State.

In New South Wales, between the Hawkesbury River and Port Jackson, this species is very common, even more so than its congener *G. chrysorrhous*, but unless there is a good rainfall, it is not often seen in the late summer months; and in periods of drought, as in the early part of 1902, in common with many other species, it leaves the district. After the cool weather sets in, from April to the end of July, it is usually met with in small flocks, from seven to ten or more in number, busily engaged in searching for insects over the ground or in low saplings.

The note is a difficult one to syllabicate, but when once heard it is easily distinguishable from that of its congener, *G. chrysorrhous*, being less musical and the strain not so sustained.

The nest is a dome-shaped structure, with an entrance in the side, slightly protected by a small hood. It is formed of strips of bark, dried grasses, with which are intermingled a few egg-bags of spiders, and the green silky covering in which some are enveloped, the inside being thickly lined, usually with feathers, and sometimes with hair or fur. An average nest measures externally four inches and a half in height by three inches and a half in diameter, and across the entrance one inch. When the nest contains eggs, the entrance is smaller and more neatly rounded than it is after the young ones are hatched and the parents repeatedly pass in and out while attending to their wants. A nest found at Roseville, on the 16th September, 1901, in a thin rotten stump, which I had to pull to pieces to get at it, was first lined at the bottom with white plant down, on the top of that a thick felting of rabbit fur, and finally a quantity of feathers. It contained five fresh eggs. The lower portion of another nest, found by me at Roseville, on the 4th October, 1901, which contained four half incubated eggs, was formed almost entirely of the soft red downy tufts stripped off *Banksia* cones, the inside being lined with fowl feathers, the lining most commonly used when the nest is constructed near

* Trans. Linn. Soc., Vol. xv., p. 226 (1826).

houses. I have seen a great number of the nests of this species, having found as many as three in an afternoon within a quarter of a mile of my house at Roseville, but I never saw one in the position erroneously figured and described by Gould.¹ All were more or less concealed, chiefly under a loose piece of rough bark hanging from the trunk of a tree. Others were built among loose bark in the upright fork of a tree, a hole in the stem, or in the angle formed by the bark being stripped from the upper portion and still attached, but fallen against the trunk. I have also found them inside a small rotten stump, the entrance alone being visible in a narrow cleft, through which the bird had to pass to gain access to it; and I saw one, containing three eggs, that was taken from a mortice-hole in a post. As a rule, the nests are built about five or six feet from the ground, some as low as two feet, others at an altitude of thirty feet; but I saw a pair of birds carrying food to young ones in a hollow spout formed in the end of a broken off lateral limb of a dead gum-tree at a height of fully sixty feet. Near Dalveen, on the highlands of the Darling Downs, Southern Queensland, Dr. A. M. Morgan and his brother, Mr. E. R. Morgan, found several nests of this species sheltered beneath the umbrella-like covering formed on the under-side of the compact mass of leaves of Grass-trees (*Xanthorrhoea hastilis*). One found early in September, 1903, was built among the underneath straggling dead leaves, at a height of three feet six inches from the ground, and contained four heavily incubated eggs.

The eggs are usually four in number for a sitting, only on one occasion have I found five, oval or swollen oval in form, some specimens tapering sharply towards either end. They are of a pure white or fleshy-white ground colour, over which is sprinkled freckles and small irregular-shaped spots, varying from light red to rich brownish-red, the markings as a rule being confined chiefly to the larger end, where in some instances they are confluent and form a well defined cap or zone. Some specimens are very sparingly marked, and one set I saw that was taken from a nest built in the mortice-hole of a post was pure white. A set of five, taken at Roseville on the 16th September, 1900, measures as follows:—Length (A) 0.61×0.47 inches; (B) 0.63×0.48 inches; (C) 0.65×0.47 inches; (D) 0.62×0.47 inches; (E) 0.62×0.58 inches. A set of four, taken in the same district on the 4th October, 1901, measures:—(A) 0.65×0.5 inches; (B) 0.62×0.48 inches; (C) 0.62×0.5 inches; (D) 0.63×0.48 inches.

Nidification in New South Wales usually begins at the latter end of August, and the nest is constructed in ten to twelve days. The eggs are deposited daily, and incubation lasts about twelve days; the young ones remaining in the nest from eighteen to twenty-one days. Although these birds may be successful in rearing their young, I have never known of an instance of their resorting to the same site in the following season, and only on one occasion have I found eggs in a nest that young birds had been previously reared in. Unlike *Geobasiliscus chrysorrhous* they do not betray their nesting-place, and seldom venture near it if an intruder is in the vicinity. The last nest I found of this species was on the 16th December, 1903. It was built in the fork of a rough-barked tea-tree, six feet from the ground, close to a well frequented path leading to Middle Harbour, and contained a single fresh egg. The breeding season usually terminates about the end of December.

The nest figured, which was in the most exposed situation I have found one, was built in a hollow in the trunk of a large Rough-barked Apple-tree (*Angophora intermedia*), at Roseville, at a height of five feet from the ground. I found it on the 1st September, 1901, when it contained two newly hatched young that had just emerged from the shell. I photographed it on the 21st September, the female feeding the young ones, which were now fully feathered, with small yellow and black butterflies while I was engaged in focussing. When comparing one that I had taken out of the nest, with the adult, which was in a small shrub not eighteen inches away,

¹ Bds. Austr., fol., Vol. iii., pl. C2 (1848).

it flew out of my hand, but I caught it and returned it to the nest. Contrary to the usual rule, the nestlings are brighter and richer in colour than the adults. On passing the tree next day, or twenty-one days since the young were hatched, they were still in the nest, but on the following day the nest was empty.

I have taken both eggs and young of the Rufous-tailed Bronze Cuckoo (*Lamprococcyx basalis*) from the nests of this species, and have seen several sets each containing an egg of the Fan-tailed Cuckoo (*Cacomantis flabelliformis*). One of the latter species, nearly fledged, was so large that it was with difficulty that I was able to withdraw it through the small aperture in the tree-trunk forming the entrance to the nest. I found an egg of *Lamprococcyx basalis*, in the nest figured on this page, a fortnight after the young Buff-rumped Thorn-bills had left it.



NEST OF BUFF-RUMPED THORN-BILL.

There is a variation in the depth of colour in examples of *Geobasileus reguloides* obtained from different parts of the continent. Specimens collected by Mr. George Masters at Gayndah, on the Burnett River, Queensland, in August, 1878, have only a slight ochraceous tinge to the yellow rump and upper tail-coverts; and the breast, flanks, and abdomen are pale yellow.

Examples collected by Mr. Edwin Ashby at Upper Sturt, Woodside, and Callington, in the hills south-east of Adelaide, and others also, received on loan from the Trustees of the South Australian Museum, are much darker than the New South Wales specimens. They may be distinguished from typical examples of *Geobasileus reguloides* by the richer and deeper ochraceous-buff rump, upper tail-coverts, basal portion and tips of tail feathers; and in two specimens the more distinct

rufous forehead and deeper ochraceous-buff under surface. Should it be necessary to distinguish the latter darker race, I would suggest the name of *Geobasileus australis*. With the above specimens, Mr. A. Zietz, the Assistant Director of the South Australian Museum, writes me as follows:—"Gould states "*Geobasileus reguloides* is extremely common in South Australia, where I observed it in every part of the country I visited"; but the birds I am sending you are not common. I have tried for the past twelve years to obtain specimens, and have only succeeded in getting two. Mr. Ashby is, however, sending you three additional skins. *G. reguloides* is either very uncommon, or Gould must have mistaken *G. chrysorrhous* for it, which is found nearly everywhere about prickly acacia hedges, as both birds bear some superficial resemblance to each other as they fly; otherwise *G. reguloides* has entirely disappeared from this district."

Dr. A. M. Morgan, who was in Sydney when I was examining these specimens, informed me that he had also seen examples of *Geobasilus reguloides* obtained in South Australia, that were indistinguishable in colour from the typical form procured in the neighbourhood of Sydney. All the birds, however, sent by Mr. Ashby and Mr. Zietz, vary as described on the preceding page.

An adult male of this deeper coloured form from South Australia measures as follows:—Total length 4 inches, wing 2, tail 1.5, bill 0.4, tarsus 0.7.

I particularly wish to point out that I regard this darker-coloured race from South Australia only as a geographical variation of the typical form of *Geobasilus reguloides*. Likewise also all the races, described in this Catalogue, for which I have proposed names, and which appear in the text of the letterpress only and not as head-lines to a species. They are in my opinion, however, far more entitled to full specific recognition than many others that are recognised as such, say for instance, *Acanthiza aphialis* and *A. diemenensis*, which are only really geographical variations of *A. pusilla*, and not distinct species. As I have shown elsewhere,* I am greatly opposed to the multiplication of names, where they tend to mystify rather than to assist any ordinary intelligent observer in identifying a specimen, without having first to ascertain the locality in which it was procured. Giving full specific rank to what is only a climatic race or geographical variation of the typical species, cannot be too strongly deprecated. The mischief wrought, too, by the undue prominence given by some ornithologists to these geographical variations, is shown in an excellent and most instructive paper read by Dr. Jonathan Dwight, Junr., at the "Twenty-first Congress of the American Ornithologists' Union,"† convened in Philadelphia, United States, in November, 1903, which I have here transcribed in full,—entitled "The Exaltation of the Subspecies":

"Whatever may be the intrinsic worth of the subspecies, signs are not wanting, at the present time, that its value, especially in the domain of ornithology, is impaired by the undue prominence which it has attained. Some of us hold it so close to the eye that all fields beyond are obscured and the one near object becomes not a part of ornithology but the aim and end of all our research. Our efforts are so one-sided that minute variations of dimension or colour are magnified by their very proximity until they afford foothold for the rising flood of names that threatens to undermine the very foundations of trinomial nomenclature. It seems to be forgotten that the subspecies is only a *convenient* recognition of geographical variation within the limits of the species. Its rise began when the distribution of the species of many parts of the globe had been thoroughly determined, and systematists welcomed it as a new and useful outlet for activity. Since that time down to the present, the dividing and re-dividing of old species into geographical races or subspecies has gone on apace—not as a matter of making two blades of grass grow where one grew before, but of splitting the one blade.

"The luxuriant growth of the subspecies, while unquestionably due to numerous and complex causes, depends, in a large degree, upon man's natural and proper desire to bestow names upon the objects about him. Unfortunately the giving of a name, be it ever so scientific, is hedged in by no prerequisites of scientific training, and many have been the blunders committed through ignorance and haste. We are, after all, only human, but one of the greatest misfortunes that can befall is when a dim conception of evolution leads us to confuse plasticity of a form to its environment with plasticity in our own brain. We must beware lest we name that which exists only in our expectant mind. A subspecies potential is a fact, a subspecies named, an opinion, for in giving a name we express an opinion which may or may not fit the fact. As a working hypothesis, it is convenient to consider the subspecies as an incipient species, but to name every degree of incipency is pushing matters to a point

* Austr. Mus. Spec. Cat.—"Nests and Eggs Austr. Bds., Pt. ii., p. 78 (1902).

† "Auk," Vol. xxi., p. 64 (1904).

where the name, by overshadowing the fact, ceases to be the convenient handle for which it is primarily intended. The tail begins to wag the dog, and, in the eyes of some, it really seems to be more important than the dog.

"Another, but less potent cause for the rise of the subspecies is found in the unnecessary prominence accorded it in our books and other publications. Wherever we turn we find it, to all appearances, on equal terms with the full species. It is clothed in the same type, while descriptions, measurements, synonymy and other matters are displayed independently as if every name were of equal value. No wonder the impression is created that the subspecies is quite as important as the species and deserving of the same treatment. We forget that, as names multiply, they lose in definiteness of meaning, and that the standard by which races are measured falls in direct proportion to the number of names resulting from new campaigns over old ground. Ornithology, in North America at least is suffering from too many campaigns.

"But the mind of the young ornithologist is strongly influenced by what his elders do, and if they make much of the subspecies he is likely to do the same. Hence, if we expend so much effort in seeking new lines of geographical cleavage, it is not inconceivable that our successors may reduce our splinters to sawdust and bestow a name upon each and every grain. It is to be hoped, however, that the limits of the human eye and of the vernier scale will not be the only goal of the ornithologist, for true science does not receive much uplifting from the mere renaming of a few handfuls of skin and feathers. How well revision and renaming have worked in the past, when the species were the units, is shown by the long array of synonyms that burden many a page. Synonymy might fittingly be called the science of the blunders of our predecessors, and we ourselves shall need deliverance from an intolerable load of names unless our fragile subspecific refinements are woven of stronger threads. We discover and name trivialities because we like to do it, and new names loom very large even if they mean little. We confuse nomenclature and ornithology, forgetful that names which should be the tools of the ornithologist may easily become the playthings of the systematist. If the subspecies be relegated to its proper place and held in proper perspective, we shall neither flounder in a flood of names nor fail to perceive the opportunities which lie open before us. There is more serious work on hand than the naming of subspecies, if the advance of ornithology is to keep pace with that of kindred sciences."

Trinomial nomenclature has not been adopted by Australian Ornithologists, although that does not protect Australian ornithological literature from the hair-splitting of the most ardent subspecies-maker resident elsewhere. Comparatively very few British and Continental Ornithologists make use of the subspecific distinction. It is useful, however, and has this advantage, one knows at a glance that the added trinomial refers only to a geographical variation of a typical form; whereas in binomial nomenclature, one may possibly discover after the loss of much time in searching out an original description, that the supposed specific value does not exist, and that a name has been given to a form that very often does not merit even subspecific recognition. As referred to by Dr. Dwight, the separation of the geographical variations of a typical form is strained by some writers almost to the breaking point, or quite so, thereby encumbering the ornithological literature of many species with useless synonyms which are neither flattering to the describers of them, nor of interest to the student or general reader.

Genus ACANTHORNIS. Legge.

Acanthornis magna.

MOUNTAIN WREN.

Acanthiza magna, Gould, Bds. Austr., fol., Suppl., pl. 28 (1869); *id.*, Handbk. Bds. Austr., Vol. I., p. 373 (1865).

Scricornis magna, Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 308 (1883).

Acanthornis magna, Legge, Proc. Roy. Soc. Tas., 1886, p. 236; *id.*, Ibis, 1888, p. 93; Sharpe, Handl. Bds., Vol. IV., p. 222 (1903); North, Proc. Linn. Soc. N.S.W., 30th March, 1904.

ADULT MALE—General colour above olive-brown, passing into a reddish-brown on the lower back and rump; upper wing-coverts greyish-black slightly tinged with olive, the median and greater series tipped with white; quills greyish-black, the outer primaries narrowly edged with ashy-white, the secondaries edged with white around the tip, more broadly on the innermost series; upper tail-coverts reddish brown; tail feathers ashy-brown, the central pair washed and the remainder externally margined with reddish brown and crossed with a broad subterminal black band, the lateral feathers with a broad white margin near the end of their inner webs, the outer web of the outermost feather also edged with white at the tip; head olive-brown, an indistinct line of feathers extending from the nostril over the eye whitish; feathers below the eye dull ashy-black, the ear coverts of a slightly clearer ash colour, and having narrow indistinct white shaft-lines; cheeks, chin, throat, and all the under surface yellowish-white or light straw-yellow, slightly richer in colour on the centre of the breast; sides of the body, flanks, and thighs warm olive-brown, the inner sides of the latter straw yellow; under tail-coverts light straw-yellow, some of the longer feathers with brown centres; "bill blackish-brown, lighter at the base of the lower mandible; legs and feet olive-brown; iris yellowish-stone colour;" (Atkinson). Total length in the flesh 4.5 inches, wing 2.15, tail 1.9, bill 0.5, tarsus 0.9.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Tasmania.

THIS single representative of a very distinct genus, although by no means plentiful, appears to be widely distributed over the island of Tasmania. Dr. L. Holden observed one in the scrub at the mouth of Sister's Creek, on the north-west coast of Tasmania. Mr. G. H. Hinsby has found several of its nests on Mount Wellington, near Hobart, in the south-eastern part of the island; and at Waratah, at the foot of Mount Bischoff. Mr. E. D. Atkinson and his son, Mr. R. N. Atkinson, have obtained birds, nest, and eggs. Gould, who described the type of this species from a specimen obtained in the northern part of Tasmania, by Mr. Ronald C. Gunn, figures it in his "Supplement to the Birds of Australia" under the name of *Acanthiza magna*; while Dr. Sharpe, in the "Catalogue of the Birds in the British Museum,"[†] places it in the genus *Scricornis*. For an opportunity of examining a series of these birds, I am indebted to Mr. R. N. Atkinson, who first kindly forwarded to the Trustees of the Australian Museum two specimens in the flesh, an adult male and female, which he had shot in the scrub at Waratah, on the 15th March, 1902. Although allied to both *Acanthiza* and *Scricornis*, the distinctly curved bill alone would have been sufficient to justify Colonel Legge in separating it from either, and instituting for its reception the genus *Acanthornis*, in which he places it.[‡] In addition to other characters, it differs from either *Acanthiza* or *Scricornis*, in having long downy plumes on the lower back, which are even more pronounced than in *Pycnoptilus*. There is very little difference in the two birds sent by Mr. Atkinson, the female being but of a slightly lighter shade of yellow on the under parts: the white tips to the greater

* Bds. Austr., fol., Suppl., pl. 28 (1869).

† Cat. Bds. Brit. Mus., Vol. vii., p. 308 (1883).

‡ "The Ibis," 1888, p. 93.

wing-coverts are much smaller, and are entirely lost in the median series, but this may be due to age and not a sexual character. Others, forwarded in the flesh by Mr. Atkinson in June, 1902, and March, 1904, present no difference from those described on the preceding page. The stomachs of these birds I examined contained the remains of insects, principally of small black beetles.

Mr. R. N. Atkinson informs me that this species frequents the undergrowth at Mount Bischoff, and that it has much the same note as *Acanthiza diemenensis*, but louder; also that it utters a faint twitter while creeping about the low herbage. On the 30th September, 1899, he found a nest near Waratah, containing three fresh eggs. The nest, which I have now before me, is a large domed structure, with an entrance in the side. It is loosely formed externally of dried sheaths of grasses, weeds, and ferns, intermingled with a few pieces of bright green mosses; the inner wall of the nest is thick and compactly constructed of fern rootlets, thin strips of bark, and very fine grasses, and it is thickly lined with feathers of the Yellow-bellied Parrakeet, thistle-down, and the downy covering of freshly budded fern fronds. It measures six inches and three-quarters in height by four inches and three-quarters in width, and across the entrance one inch and a quarter. "It was built in a clump of grass and rushes in a swamp, close to some 'fireweeds.'"

The eggs from the above nest, which Mr. Atkinson has kindly lent for description, are oval in form and nearly equal in size at each end, the shell being close-grained, smooth, and lustreless. They are of a dull white ground colour, which is spotted and blotched with different shades varying from pale to rich purple, the markings—many of them penumbral—being confined almost entirely to the larger end. On one specimen the blotches are confluent and form a small but well defined zone; on another the markings consist chiefly of a band of isolated spots intermingled with one or two clusters of larger and darker blotches overlying paler ones; the remaining specimen has a few very small but distinct spots on one side of the larger end, and three or four larger confluent spots of different shades on the other, forming a conspicuous patch:—Length (A) 0.72×0.54 inches; (B) 0.72×0.56 inches; (C) 0.75×0.57 inches. An egg from a set of three, taken by Mr. G. H. Hinsby on the 29th October, 1886, at Kangaroo Valley, about five miles from Hobart, is a thick oval in form and tapers gradually towards each end, which are nearly equal in size; it is white with fine freckles of dull red, particularly towards one end, where they form an irregular-shaped zone:—Length 0.71×0.56 inches. Another egg, taken by Mr. Hinsby, is oval in form, white with light red and reddish-brown markings, which are mostly confined towards the thicker end of the shell:—Length 0.75×0.54 inches. Although usually more swollen in form, and nearly equal in size at each end, the egg of this species is like that of the larger species of typical *Acanthiza*.

Genus *APHELOCEPHALA*, Oberholser.

Aphelocephala leucopsis.

WHITE-FACED SQUEAKER.

Xerophila leucopsis, Gould, Proc. Zool. Soc., 1840, p. 175; *id.*, Bds. Austr., fol., Vol. III., pl. 67 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 382 (1865); Gadow, Cat. Bds. Brit. Mus., Vol. VIII., p. 73 (1883).

Aphelocephala leucopsis, Oberh., Proc. Acad. Nat. Sci. Philad., 1899, p. 214; Sharpe, Hand-l. Bds., Vol. IV., p. 312 (1903).

ADULT MALE—General colour above brown, the feathers on the crown of the head with small indistinct darker brown centres; upper wing-coverts like the back; quills brown narrowly edged externally with ashy-brown; upper tail-coverts greyish-brown; tail feathers brown at the base,

passing into blackish-brown on the apical portion, all but the central pair largely tipped with white on the inner web and to a far less extent across the extreme tip of the outer web; lores and forehead white, bordered above by a narrow line of dark brown; anterior portion of cheeks white; ear-coverts brown; chin dull white; remainder of the under surface dull white slightly washed with fulvous, the latter colour more pronounced on the abdomen; sides of the breast pale brown; flanks fulvous brown; under tail-coverts white tinged with fulvous; bill black; legs and feet brownish black; iris yellowish-white. Total length in the flesh 5 inches, wing 2 $\frac{1}{2}$, tail 0.5, bill 0.3, tarsus 0.7.

ADULT FEMALE.—Similar in plumage to the male.

Distribution. Southern Queensland, New South Wales, Victoria, South Australia, Central Australia, Western Australia.

IN the "Catalogue of Birds in the British Museum," Dr. H. Gadow places the genera *Nerophila* and *Sphenostoma* of Gould, in the sub-family Parinae, and remarks: "*Nerophila* seems to form a link between the true Parinae and those forms which I propose to distinguish as Austro-Parinae." Neither of these genera should be included in the Parinae. *Nerophila*, although differing in having a deep cone-shaped bill, undoubtedly comes nearest to the genus *Geobasilens*, which it closely resembles in habits; *Sphenostoma* appears to be an anomalous form, far removed from the sub-family Parinae, of which *Parus major* is the type, its nearest Australian allies being *Oreocitta cristata* and *Psaltriparus cafer*. Later on, Mr. H. C. Oberholser pointed out, in the "Proceedings of the Academy of Natural Sciences of Philadelphia,"¹ that the name of *Nerophila* had been preoccupied by Held, in 1837, for a genus of Mollusca, and proposed that of *Apheloccephala*, of which *Nerophila lineopsis*, Gould, is the type.

In favourable situations, the present species is distributed over the greater portion of the southern half of the Australian continent. In New South Wales it is strictly an inland species, but in Victoria, and South and Western Australia it is also found near the coast. Open forest country, and plains intersected with belts of *Callitris*, or scrubby undergrowth, are its usual haunts, but it is of an extremely sociable disposition and may be often seen about farms and outbuildings. I found it tolerably numerous in the neighbourhood of the Macquarie River, in August, moving about in flocks numbering from eight to twenty individuals, and nearly always on the ground searching for insects and their larvae, which constitute its usual food. It is chiefly terrestrial in its habits, and is exceedingly tame, merely flying on to the nearest tree or fence when too closely approached, and descending on to the ground again immediately one has passed. At Dubbo, where I first observed this species, it was feeding on the grassy sward in company with *Geobasilens chrysorrhous*. It is known in many parts of New South Wales as the Squicker.

The nest is a large dome-shaped structure, with an entrance in the side or top; outwardly it is composed of strips of soft bark and grasses, and is lined with feathers, fur, or other soft material. It varies in size according to the position in which it is built, an average one taken from a hollow branch of a dead mulga measuring externally eight inches in length by four inches in breadth, and across the entrance one inch and a half. It is usually built in a hollow branch or hole in the trunk of a small tree. Mortice-holes in the posts of stock-yard fences, and the interstices between the thick sticks forming the bottom of the nests of the Wedge-tailed Eagle, are also favourite situations, and occasionally it is built in the branches of a low spreading shrub. Frequently it resorts to dwellings and outhouses, constructing its nest in the spouting or between the roof and the ceiling. Any favourable situation under cover is availed of as a nesting-place by these sociable little birds, consequently they are sometimes found in curious places. On Wattagoona Station, near Louth, a pair built in the spout of a

* Cat. Bds Brit. Mus., Vol. viii., pp. 73-74 (1883).

† Proc. Acad. Nat. Sci. Philad., 1890, p. 214.

large pump, which had to be taken to pieces to remove the obstruction, when the nest was found to contain four fresh eggs. On another station in the south-western district of New South Wales, the late Mr. K. H. Bennett informed me that in November, 1885, he saw a nest built in the pocket of an overcoat that had been left for some time hanging on a nail under the verandah of the homestead. The owner of the coat, observing the birds going in and coming out of the pocket, allowed it to remain there, and at the time of Mr. Bennett's visit he saw one of the old birds go in several times with food, although he was only standing a few feet away from the coat.

During a trip made by Dr. A. M. Morgan and Dr. A. Chenery to Mount Gunson, situated to the north-west of Port Augusta, South Australia, in July and August, 1900, they met with this species, and Dr. Morgan writes me as follows:—"*Xerophila leucopsis* is the commonest bird in the district, and found wherever there is any scrub, also about the houses of stations. Nests were plentiful, built in all manner of situations, but always in a hollow or hole of some kind. A favourite site was a hole in the soft decaying gypsum cliffs. On the 3rd August, we found three nests in this position, one contained fresh eggs, another incubated eggs, and the third young birds. In October, 1891, I found a pair of these birds building in a railway truck lying at a siding at the Finnis Railway Station. They had laid two eggs when the truck was removed. At Mount Gunson, in July, 1901, a pair built a nest in an old packing case at the back of the store; they were still building at the time of my departure. A common nesting-place in the Mount Gunson District was the breeding tunnel of *Cheramaca leucosternum*. They did not go to the end of the tunnel, but made a chamber for themselves just inside the opening."

From the Broken Hill District, in South-western New South Wales, Dr. W. Macgillivray writes me:—"*Xerophila leucopsis* is common along all the creeks and amongst scattered clumps of timber. It builds in a hollow of tree, or a clump of mistletoe; a favourite nesting-site being the under surface or side of a Whistling Eagle, Wedge-tailed Eagle, or Crow's nest."

Mr. Joseph Gabriel informs me that in September, 1896, at Werribee, Victoria, he found the nests of this species built in the interstices of stone walls used to subdivide the paddocks in that neighbourhood.

The eggs are usually three or four, sometimes five in number for a sitting, oval or thick oval in form, the shell being close-grained and smooth, some specimens being slightly glossy, others lustreless. They vary in ground colour from pure white to dull white and pale buff, which is usually more or less obscured by freckles, spots, and small irregular-shaped blotches of either light brown, reddish-brown, or chocolate-brown, intermingled with a few similar underlying markings of dull bluish or violet-grey. In some specimens the markings are indistinct, in others well defined and predominating at the thicker end, where they are confluent and assume the form of a zone. Of rarer varieties now before me, one set of an almost pure white ground colour, has a broad band of rich chocolate-brown on the thicker end, and a few fine freckles of the same colour scattered over the shell. Another set, with a similar ground colour, has an irregular-shaped zone formed of small confluent purplish-brown markings around the thicker end, the remainder of the shell being, with the exception of one or two fine dark brown hair-lines, entirely devoid of markings. A set of four measures as follows:—Length (A) 0.77 × 0.58 inches; (B) 0.77 × 0.6 inches; (C) 0.76 × 0.58 inches; (D) 0.77 × 0.59 inches. A set of three measures:—(A) 0.72 × 0.55 inches; (B) 0.7 × 0.54 inches; (C) 0.7 × 0.55 inches. An unusually small set of two measures alike 0.66 × 0.54 inches.

In South Australia, Dr. Morgan found these birds breeding in July and August. In Central Australia, Mr. C. E. Cowle obtained nests with eggs and young in April, also in December and January. Nests with fresh eggs were found by the Calvert Exploring Expedition in Western Australia in August. About Wellington and Dubbo, in New South Wales, the breeding season lasts from August until the end of November; while in the Broken Hill

District, in the south-western portion of the State, Dr. Macgillivray noted this species breeding in 1901 from June to the end of October. Near Lake Austin, in the Murchison District, Western Australia, Mr. C. G. Gibson informs me that he found a nest on the 28th August, 1903, built in a small hollow stump, containing six eggs, all fresh; and another on the following day, built in the hollow limb of a dead mulga, with eight eggs, some being fresh, others slightly incubated. In each instance only one pair was observed about each nest.

Aphelocephala nigricineta.

BLACK-BANDED SQUEAKER.

Xerophila nigricineta, North, Ibis, 1895, p. 340; *id.*, Rep. Horn Sci. Exped., Pt. II, Zool., p. 82 pl. 7, upp. fig. (1896).

Aphelocephala nigricineta, Oberhol., Proc. Acad. Nat. Sci. Philad., 1899, p. 214; Sharpe, Hand-l. Bds., Vol. IV, p. 312 (1903).

ADULT MALE—General colour above pale cinnamon, becoming richer and darker on the back and rump; upper wing-coverts brown; quills brown, the innermost secondaries dark brown and broadly margined with pale cinnamon, the remainder of the secondaries narrowly edged externally with pale cinnamon and tipped with white slightly washed with cinnamon; upper tail-coverts pale cinnamon; two central tail feathers dull blackish-brown, faintly washed and tipped with pale cinnamon, the remainder blackish-brown with a spot of white at the tip of the inner web, increasing in extent towards the outermost feather, which is broadly tipped and narrowly edged on the outer web with white; crown of the head brown washed with cinnamon and having small darker brown centres to the feathers; forehead, lores, and fore part of cheeks buffy-white, narrowly margined above with an indistinct blackish line; ear-coverts cinnamon-brown; sides of the neck pale cinnamon; chin, throat, and all the under surface dull white slightly tinged with buff, and crossed on the breast with a distinct narrow black band; feathers on the lower sides of the body subterminally barred with rich chestnut; under tail-coverts white slightly tinged with buff; bill black; legs and feet purplish-black. Total length 3.9 inches, wing 2.2, tail 1.55, bill 0.3, tarsus 0.7.

ADULT FEMALE—Similar in plumage to the adult male.

Distribution.—Central Australia.

THIS species was one of the novelties obtained by the members of the Horn Scientific Expedition when in Central Australia in 1894. It may be distinguished from *Aphelocephala pectoralis*, to which it is more nearly allied, by having the breast crossed by a narrow black band instead of a broad band of cinnamon-brown across the chest as in that species.

Mr. Keartland has forwarded me a nest and several sets of eggs of this species, received from Mr. C. E. Cowle, and the latter has kindly favoured me with the following notes:—"The eggs of *Xerophila nigricineta*, taken in March, 1899, were obtained from out of a big domed nest in a 'raspberry bush.' It was composed of long dead pieces of cotton and raspberry bush, with an entrance in the side, and lined with grass and feathers of many kinds, and too large to conveniently carry on horseback. I saw the bird leave the nest. In June and July of the same year they were nesting all about the stony plain between Erldunda and Attitara. They



BLACK-BANDED SQUEAKER.

favour most the 'Raspberry,' or 'Dead Finish' (*Acacia ulicina*). One was placed in a thick cotton-bush, and another, which I am sending you, was in a split rotten mulga. The general appearance of the nest, when built in bushes, is old, unkempt, and rough, like that of *Pomatostomus rubeculus*. All the nests I took during July and August, also of *Xerophila leucopsis*, which I found breeding at the same time, had three eggs in."

The nest sent by Mr. Cowle, and taken by him from a rotten mulga, is a long cylinder in shape, with an enlarged entrance near the centre, and is constructed of fine shreds of bark, dead grasses, and debris: the nesting cavity, which is very small, is lined with feathers. It measures eight inches in length by three inches and a half in breadth, the inner portion of the nest measuring three and a half inches in height by two inches and a half in diameter, and across the entrance one inch and a half. As with the nests of *Aphelocphala leucopsis*, the size and shape would vary according to the position in which they are built, those placed in bushes being, as a rule, more bulky structures than others formed in hollow branches.

The eggs are usually three or four in number for a sitting, oval in form, the shell being close-grained, smooth, and slightly lustrous. In ground colour they vary from dull white to buff and a warm brownish-white, which is thickly freckled and occasionally blotched with dull reddish or faint amber-brown, in some specimens uniformly over the shell, in others entirely at or predominating on the thicker end, where, intermingled with similar markings of dull violet-grey, well defined zones are formed. A set taken by Mr. C. E. Cowle in April, 1898, measures as follows: Length (A) 0.65 x 0.49 inches; (B) 0.65 x 0.49 inches; (C) 0.63 x 0.5 inches. A set taken at Erldunda, in the following July, measures:—(A) 0.66 x 0.5 inches; (B) 0.68 x 0.52 inches; (C) 0.67 x 0.52 inches.

Mr. Cowle has usually noted this species nesting from the latter end of February to the middle of August; but after heavy rains, he found them breeding freely in December, 1902, and January, 1903.

Genus SERICORNIS, Gould.

Sericornis citreogularis.

YELLOW-THROATED SCRUB-WREN.

Sericornis citreogularis, Gould, Proc. Zool. Soc., 1837, p. 133; *id.*, Bds. Austr., fol., Vol. III., pl. 46 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 354 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 302 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 220 (1903).

ADULT MALE—General colour above dull olive tinged with yellow, becoming slightly richer in colour on the rump and upper tail-coverts; lesser wing-coverts like the back, the median and greater coverts blackish, margined with yellowish-olive; primary coverts black; quills blackish-brown, basal portion of the median series of the primaries externally edged with light olive-yellow, the outer webs of the outermost secondaries, and both webs of the innermost series olive-brown shaded with yellow; tail feathers ruddy-brown, the central pair and outer webs of the remainder rich olive-brown; crown of the head olive-brown tinged with yellow; forehead, lores, and feathers above and below the eye extending in a broad band beyond the ear-coverts black, bordered above with a narrow white line over the lores, and widening out into a broad light greenish-yellow streak above the ear-coverts; sides of the neck dark greenish-yellow; cheeks and throat yellow; fore-neck pale olive-brown washed with yellow; centre of the breast and abdomen white washed with yellow; sides of the breast olive-brown; under tail-coverts dull white; bill dark brown; legs and feet fleshy-brown; iris yellowish-white. Total length in the flesh 5.3 inches, wing 2.7, tail 2.1, bill 0.55, tarsus 1.1.

ADULT FEMALE—Similar to the male, but the forehead is olive-brown like the crown, and the broad patch extending from the lores above and below the eye on to the ear-coverts, instead of being black, is dull olive-green with a dusky wash on the lores.

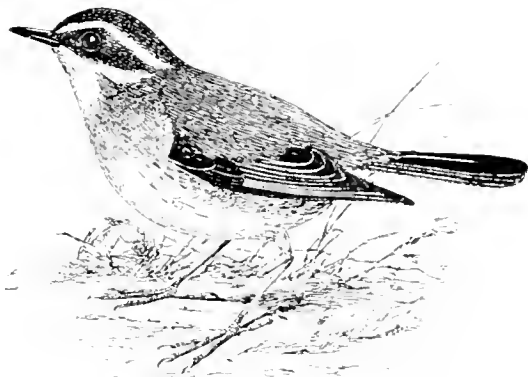
Distribution—Eastern Queensland, Eastern New South Wales.

THE Yellow-throated Scrub-Wren is distributed in favourable situations throughout the coastal districts of the greater portion of Eastern Queensland and Eastern New South Wales. It is represented in the Australian Museum collection by skins obtained as far north as the Bloomfield River District, by numerous examples from the Cairns and Herberton Districts, Queensland, and by others procured as far south as the Illawarra District of New South Wales.

It is usually met with in pairs, searching for insects in the bed of a creek, on logs, or among fallen leaves. The female is of a tame and fearless disposition, often building her nest within a few yards of an intruder. Seldom, except for the purposes of nest-building does this species perch in trees. It utters a pleasing and rich clear note, which may be heard some distance away.

Individual variation exists in the colour of this species. Some specimens have the fore-neck entirely yellow like the throat, others have the sides of the breast more strongly washed with olive-brown. Compared with examples obtained in New South Wales, adult males from the Bloomfield River and Herbert River Districts, North-eastern Queensland, have the median and greater wing-coverts more distinctly margined with yellow, the edges of the outer webs of the primaries a deeper yellow and the secondaries a richer olive-brown. The average wing-

measurement of birds from these parts is 2.55 inches, but it varies from 2.5 to 2.7 inches. The average wing-measurement of adult males obtained by me at Ourimbah, New South Wales, is 2.7 inches.



YELLOW THROATED SCRUB-WREN.

In New South Wales it is essentially an inhabitant of the rich brushes of the coastal districts, and the secluded valleys of the contiguous humid mountain-ranges. In favourable situations, wherever palms and cycads flourish, this species is found. It haunts the sides of creek banks and leaf-strewn open mossy glades, sheltered above with a thick umbrageous growth. Although abundantly distributed just

beyond the northern and southern boundaries of the County of Cumberland, it is only found in a few places towards the northern and southern boundaries of it, chiefly about Narrabeen Lagoon and the Cabbage palm scrubs near Lily Vale, Otford, and Bulli. It is plentiful at Gosford and Ourimbah, on the northern side of the Hawkesbury River, and is freely distributed in similar situations throughout the Illawarra District, in the south-eastern portion of the State.

The nests are large, bulky pear-shaped or domed structures, with an entrance in the lower portion more or less protected by a hood. Externally they are formed of rootlets, skeletons of leaves, and mosses intermingled together, and lined inside at the bottom with feathers. When they are built in the brush, they are usually thickly coated externally with mosses, but seldom have this outer covering when overhanging water, and then resemble more a mass of debris attached to an overhanging branch. An average nest measures externally twelve inches in length by six inches in breadth, and across the entrance one inch and a quarter; but they vary much in size, and frequently from nine to twelve inches of nesting material may be built around a branch before the domed portion is commenced. They are attached near the ends of drooping leafy branches, at an altitude varying from two to forty feet. More often they are built in trees or vines overhanging water, frequently five or six feet above the surface, sometimes as low as two feet, and rarely higher than twelve feet when placed in this situation. Little or no preference seems to be shown in the selection of a tree as a nesting-site, but I have invariably noticed that they are built higher in the forest than when overhanging water.

Mr. W. M. Thomas presented to the Trustees of the Australian Museum five nests of this species attached to one another, built on a long vine which he found in December, 1897, growing under a rock shelter near the Macquarie Pass in the Illawarra District. This is a most unusual site for this species to build in, and, judging by the different appearance and condition of the nests, it had probably been resorted to by the same pair of birds year after year. The entrance to two of the nests was blocked up by the others being built against them,

and in one, of which I was able to examine the interior, I found several pieces of egg-shell.



NEST OF THE YELLOW-THROATED SCRUB-WREN.

set measures:—Length (A) 0.93 × 0.67 inches; (B) 0.95 × 0.7 inches. Another set of three, taken on the same day in a nest close by, measures:—Length (A) 1.05 × 0.77 inches; (B) 1.03 × 0.73 inches; (C) 1.05 × 0.74 inches.

Nidification, which I had many opportunities of observing, is performed by the female alone, and usually occupies about eleven days. The nest is shaped as the work proceeds, there is no thin skeleton or framework made first, to be filled in afterwards. Viewing the nest from

The eggs are two or three in number for a sitting. On the Richmond and Clarence Rivers seldom more than two are laid, but about Ourimbah I found more nests with three eggs than I did with two. They vary much in shape, size, and colour, even when found in nests near one another. Ovals, elongate-ovals, and swollen ovals are common, and among the latter type may be found specimens tapering sharply towards both ends; the shell is close-grained, and its surface smooth and glossy. In ground colour they vary from pale chocolate-brown to almost pure white with a tinge of chocolate-pink, and as a rule are lighter in colour on the smaller end; some have a faint slaty shade in the ground colour; occasionally, in others, it is as nearly dark as is found in the eggs of *Pyrholaemus brunneus*. On the larger end is almost invariably a zone or cap formed of clouded markings of a distinctly darker shade than the ground colour. In a very dark set of two, taken by me at Ourimbah, on the 27th November, 1901, the larger ends are a uniform dark slaty-brown. This

below, when about half built, it resembles in shape a bell suspended to a branch, a place being left for the entrance, and the domed lower portion gradually worked on after; it is then thickly lined inside at the bottom with feathers. It is a remarkable fact that in some scores of these nests I have examined, the entrance was always, with one exception, on the same side as the under surface of the leaves of the branch to which it was attached, and consequently when built over water always facing the bank. The exception to this rule is the nest here figured, built in a Maiden's Blush tree, at a height of thirty-five feet from the ground. An entrance had been made in the usual place in this nest, but had been closed up at the back by the birds and another formed in the same side as the front or upper surface of the leaves. I have never known of an instance of *Sericornis citreogularis* forming its nest in a bunch of moss hanging from a bough. Two nests that the writer had under observation at Oonibah were commenced on the 7th November, 1901, and on the 25th instant three eggs were taken from each. The eggs were deposited on alternate days. Frequently two or more nests are found on branches of the same tree, presumably the labour of the same pair of birds during previous seasons. I have sawn off branches with nests containing eggs, and four days later found the birds building on the next branch. The nests are almost invariably conspicuous objects and easily seen. One I found on the 27th November, 1901, containing two incubated eggs, however, was fairly well concealed. It was attached to the underside of a dead leafy bough of a large Maiden's Blush tree that had fallen into a creek, the nest being only two feet from the water. The nest figured on the preceding page was found close by the same day, and contained two fresh eggs.

Mr. Edwin Ashby forwarded me a box of specimens for examination, collected by him in the Blackall Ranges, Southern Queensland, at an altitude of about 1,500 feet, and among them are two nests of this species and several of its eggs. They are somewhat similar structures to those described above, but are built in Lawyer-vines (*Calamus australis*). With them Mr. Ashby sent the following information: "I found about ten or a dozen nests of *S. citreogularis* during the three days I was in the Blackall Ranges, the 20th September to the 1st October, 1903. All were suspended on Lawyer-vines, mostly eight to ten feet from the ground, one as high as sixteen feet. The first nest found must have been twelve feet high, and contained three eggs, two olive-brown and one light cream colour. In one place a lawyer-vine, probably blown off some tree by the wind, had fallen right across a running creek, lodging on some low bushes on the other side, thus making a suspension bridge over the water. There were four nests on this vine, two directly over the water, one almost over it, and the fourth about two yards from the edge of the bank. In company with Mr. W. L. May, during the two days available, we visited this spot and spent some time watching the nests in the hope of seeing the birds go in. One was soon found to be occupied by an *Acanthiza*, with nearly fledged young, and of the same species as I send you skins. The second nest contained typical eggs of *Sericornis citreogularis*. On the 1st October we took the eggs from the middle nest, and were surprised to find that they were the eggs of another species of *Sericornis*, not *S. citreogularis*."

The skins of *Acanthiza*, forwarded by Mr. Ashby, are those of *Acanthiza pusilla*. One of the two eggs taken on the 1st October from the nest of *Sericornis citreogularis*, is that of *S. magnirostris*, and is precisely similar to two eggs of the latter species taken by Dr. Ramsay in the Richmond River District, on the 3rd November, 1866. *Sericornis magnirostris* often takes possession of the deserted nests of *Sericornis citreogularis*.

In the northern coastal districts of New South Wales, the breeding season usually commences at the latter end of August or early in September, and continues during the four following months. In the Hawkesbury River and Illawarra Districts, nidification begins about the middle of October, and fresh eggs have been taken at the end of December.

Sericornis frontalis.

WHITE-FRONTED SCRUB-WREN.

Acanthiza frontalis? Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 226 (1826).

Sericornis ocellans, Gould, Proc. Zool. Soc., 1847, p. 2; *id.*, Bds. Austr., fol., Vol. III., pl. 48 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 358 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VIII., p. 309 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 221 (1903).

Sericornis frontalis, Gould, Syn. Bds. Austr., Pt. IV., pl. 3, fig. (1838); *id.*, Bds. Austr., fol., Vol. III., text only opp. pl. 49 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 359 (1865).

ADULT MALE—General colour above brown, with a rufescent-olive wash, which is more pronounced on the rump and upper tail-coverts; lesser and median wing-coverts like the back, indistinctly tipped with white; the greater coverts blackish with white tips; primary coverts black; bastard wing feathers blackish, the outer webs narrowly edged and the inner webs broadly margined with white at the tips; quills dark ashy-brown externally washed with rufescent olive, the latter colour more pronounced on the innermost secondaries; tail feathers brown washed with rufescent-olive, and crossed by a distinct brownish-black band except the central pair and the outer web of the outermost feather; forehead, feathers in front and extending in a line below the eye blackish; a supraloral spot and a streak over the eye white, bordered on the forehead with a line of blackish feathers; ear-coverts dusky brown; chin and cheeks white; throat yellowish-white with broad blackish-brown streaks; fore-neck and centre of the breast pale yellow washed with ashy on the chest; sides of the neck and breast ashy-brown; flanks olive-brown; under tail-coverts yellowish-buff, with dark brown centres to the feathers; bill blackish-brown; legs fleshy brown; feet dark brown; iris yellowish-white. Total length in the flesh 4.7 inches, wing 2.2, tail 1.85, bill 0.47, tarsus 0.8.

ADULT FEMALE—Differs from the male in having the line over the eye of a dull white, and narrower and not so clearly defined; the lores and feathers in front of the eye are dusky-brown like the ear-coverts; the cheeks, chin, and throat are dull white, the latter devoid of blackish-brown streaks, and the tail feathers uniform in colour, or, with only a slight indication of the subterminal blackish-brown band.

Distribution.—New South Wales, Victoria, South Australia.

THE type of *Sericornis frontalis* was described by Vigors and Horsfield in the "Transactions of the Linnean Society," but the locality is not given. In describing the adult of this species, Dr. Sharpe, who had the advantage of examining Vigors and Horsfield's type in the British Museum collection, states that "the ear-coverts are rufous," although in the key to the species of the genus *Sericornis*,^{*} it is given of *S. frontalis* as "ear-coverts light rufous (juv.) or blackish (ad.)." Above his description of *Sericornis frontalis*, both *Sericornis minimus*, Gould, and *Sericornis brunneopygius*, Masters, are placed as synonyms of this species. If the ear-coverts of the type of *Sericornis frontalis*, Vig. and Horsf., are rufous, as stated by Dr. Sharpe in his description, then *S. minimus*, Gould, and *S. brunneopygius*, Masters, are rightly placed as synonyms of it. The species, too, hitherto known in New South Wales, Victoria, and South Australia, under the name of *Sericornis frontalis*, must in future bear the name of *Sericornis ocellans*, Gould, which is only the adult male of *S. frontalis*. If, however, the ear-coverts of *Sericornis frontalis*, Vig. and Horsf., are blackish or dusky-brown then Gould's name of *Sericornis minimus* must stand for the Cape York species, and *Sericornis ocellans*, Gould, rank as a synonym of *Sericornis frontalis*.

Dr. Sharpe gives the habitat of *Sericornis frontalis* as "South Australia and Victoria, extending into the interior, through New South Wales, along the east coast of Australia to

* Trans. Linn. Soc., Vol. xv., p. 226 (1826).

† Cat. Bds. Brit. Mus., Vol. vii., p. 303 (1883).

‡ Loc. cit., Vol. vii., p. 301 (1883).

Cape York, and to the Gulf of Carpentaria on the north coast." This is undoubtedly an error. The North-eastern Australian and the South-eastern Australian species are quite distinct.

Although doubtless the *Sericornis frontalis* of Gould's "Handbook to the Birds of Australia," may be found in Southern Queensland, I have never seen a specimen in any collection from there; but *Sericornis leucigaster* is not uncommon. I received for examination, from Mr. Edwin Ashby, an adult female of the latter species which he procured in October, 1903, in the Blackall Ranges, about sixty miles north of Brisbane. There is not any species of *Sericornis* found in Western New South Wales, or the interior of the continent, unless one regards *Pyrrhuloxia brunnea*, Gould, as a *Sericornis*, which Dr. Sharpe does.

I have examined the type of *Sericornis brunneopygius*, Masters, in the Macleay Museum, at the University of Sydney, which is synonymous with Gould's *Sericornis minimus*. The latter is unquestionably distinct from the New South Wales, Victorian, and South Australian species, the adult male having the ear-coverts light rufous instead of dusky brown. A fully adult specimen in the Australian Museum, obtained at Cape York, has the lores, feathers below the eye, and the ear-coverts light rufous, the throat dull white, remainder of the under surface faint yellowish-white, sides of the chest pale brown. It agrees fairly well with Gould's figure of the adult female of *S. minimus*, but has the flanks only slightly darker than the breast. Total length 3.9 inches, wing 2.45, tail 1.6, bill .05, tarsus .07.

The White-fronted Scrub-Wren is chiefly an inhabitant of humid mountain ranges and gullies, although I have often met with it in low scrub, brush, and belts of tea-tree. Generally it is seen on or near the ground in search of insects, which constitute its sole food. Under shelving banks, and low fern-covered rocky sides of gullies, are its favourite haunts, and if one remains quiet it may be seen hopping about, looking under logs and rocks, disappearing perhaps from view for a time, and re-appearing later on some distance away. It is the same among the low undergrowth, almost constantly on the move, and seldom remains long in one place.

The notes of this species resemble those of *Origma rubricata*, Latham, but are not so loud, and are varied occasionally with a succession of low creaking sounds.

Specimens procured by Mr. J. A. Thorpe at Gosford, on the northern side of the Hawkesbury River, New South Wales, are precisely similar to an example sent to me for examination by Mr. Edwin Ashby, obtained at Cape Otway, Victoria. All of them have the under surface more strongly washed with yellow than typical examples. Specimens received on loan from the Trustees of the South Australian Museum, obtained at Square Waterhole, South Australia, are similar to examples procured by Mr. R. Grant at Lithgow, on the Blue Mountains, New South Wales, and have the feathers more broadly streaked with black. Examples procured in the Illawarra District of New South Wales, are similar to specimens obtained in South Gippsland, Victoria. Formerly I regarded the species inhabiting the latter district as *Sericornis osculans*, but I have since proved that the latter is only the adult male of what I have here described under the name of *Sericornis frontalis*, Vigors and Horsfield. Typically adult males from mountainous districts, and the south-eastern portion of the continent have the throat more distinctly streaked with blackish-brown, and the subterminal bar on the tail feathers more pronounced, but I have never seen from any part of South Australia examples with the throat and fore-neck so conspicuously streaked as is shown in Gould's figures of his *Sericornis osculans*, neither have I seen any such specimens with the under parts as are represented in his figures of *Sericornis frontalis*,¹ which are at variance with his description of this species on the page opposite to it.

* Bds. Austr., fol., Vol. iii., pl. 48 (1848).

† Loc. cit., fol., Vol. iii., pl. 49 (1848).

The nest is a dome-shaped structure, with a rounded entrance in the side; it is outwardly formed of strips of bark and skeletons of leaves, and thickly lined inside with feathers, hair, or fur. Others are constructed externally of rotlets and debris, and resemble a heap of rubbish. They vary much in size, some being smaller and neater than others: an average one measures externally five inches in length by three inches and a half in breadth, and across the entrance one inch. The nesting-site is varied. In Victoria I have frequently found them about eight or ten feet from the ground, packed between two upright stems of tea-tree, or where one branch crossed another, and more or less hidden by the pieces of loose hanging bark: or among debris collected under bushes or long grass. In the humid mountain ranges of South Gippsland, I found them built at the bottom of a clump of "sword grass," the entrance alone in many instances being visible: at other times I have been startled when gathering the smaller species of ferns, by flushing the female from her nest built under the shelter of a projecting fern-covered bank. In New South Wales I have generally found them on the ground in low undergrowth, hidden by long coarse grass or bracken fern, and one I discovered at Ashfield, containing a young Fan-tailed Cuckoo, was built in the dead leafy top of a fallen gum sapling. The birds seldom betray the whereabouts of their nest, and at all times sit very close, so much so that I have unknowingly placed my hand over the entrance of the nest while the female was sitting.

The eggs are three in number for a sitting, oval in form, the shell being close-grained, smooth, and lustrous. In ground colour they vary from a faint purplish-white to pale purplish-brown, which is usually sparingly freckled with a darker shade of the ground colour, except on the larger end where there is a well defined zone or cap of dull purplish-brown. In rare instances the ground colour is almost pure white, in some it is darker on the larger end, others are only sparingly freckled with a slightly darker shade than the ground colour. Typically, however, the eggs of this species are distinctly zoned on a light ground. A set of three, taken at Middle Harbour, on the 11th August, 1893, measures:—Length (A) 0.83×0.62 inches; (B) 0.87×0.63 inches; (C) 0.85×0.62 inches. Another set of three measures:—(A) 0.78×0.6 inches; (B) 0.8×0.57 inches; (C) 0.78×0.56 inches.

For several seasons Mr. E. H. Lane and his son found many nests of this species, containing eggs or young, in the Canoblas Range, near Orange, New South Wales. Writing under date 16th December, 1899, Mr. Lane remarks:—"A nest of *Sericornis frontalis*, which my son and a friend found building on the 29th August. I took three fresh eggs from on the 12th of last September; and I found two more nests, with three young ones in each, a week later. On the 24th and the 29th September, I found on each occasion a nest with two young ones and an addled egg. I found another nest on the 6th October with three young birds, and on the 9th December saw three young birds that had just left the nest. One of these nests was built about fifteen feet from the ground, among some shoots and vines at the bottom of a small tree. Another was among some vine growth overhanging a stream, and was about a foot from the bank. A third was built under some coarse grass a yard away from a tree, and a fourth among some rubbish at the butt of a tree. None of these nests could possibly be seen, only for watching the birds going to them, and then we had to open out the bushes or grass before we could find them. The nest from which I took three fresh eggs on the 12th September, the bird sat very close, and although I repeatedly struck some rubbish just above it with a stick, the bird did not leave her eggs until I put my hand against the nest."

Young birds resemble the adults, but are duller in colour, there is no subterminal dark band on the tail feathers, the white eyebrow is not so well defined, and the lores and ear-coverts are dusky brown.

Nidification usually commences in July, and eggs may be found at the end of the month, but are more common during August. There are two, if not three broods reared during the season, for fledgelings are numerous in September, and nests containing young ones may be frequently found during the early part of January.

Sericornis magnirostris.

LARGE-BILLED SCRUB-WREN.

Acanthiza magnirostra, Gould, Proc. Zool. Soc., 1837, p. 146.

Sericornis magnirostris, Gould, Bds. Austr., fol., Vol. III., pl. 52 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 362 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 395 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 221 (1903).

ADULT MALE.—*General colour above dull olive-green; upper wing-coverts like the back, the outer and greater series with dusky centres and narrow yellowish-white margins at the tips; quills dark brown, the primaries narrowly edged externally with dull yellowish-olive which gradually passes into olive-brown on the innermost secondaries; upper tail-coverts olive-brown with a rufescent shade; tail brown, the two central feathers and the outer webs of the remainder rufescent olive-brown; head olive-brown with a rufescent wash on the frontal feathers; sides of the head pale buffy-brown; chin and throat dull white tinged with buff; remainder of the under surface dull white washed with olive-green, which is more pronounced on the abdomen and lower sides of the body; under tail-coverts pale buffy-brown tinged with olive; bill black; legs and feet fleshy brown, iris brown. Total length in the flesh 4.8 inches, wing 2.2, tail 1.8, bill 0.52, tarsus 0.7.*

ADULT FEMALE.—*Similar in plumage to the male.*

Distribution.—Queensland, New South Wales, Eastern Victoria.

IN favourable situations, the present species is distributed throughout the coastal scrubs and contiguous mountain ranges of Eastern Australia. Its large bill, and almost uniform coloured plumage, will readily serve to distinguish it from any species of the genus. It is represented in nearly every collection made by the Australian Museum collectors in the coastal districts of Queensland and New South Wales. In the latter State it is common in the brushes of the Tweed, Richmond, Clarence, and Bellinger Rivers. This species inhabits chiefly the same luxuriant subtropical growth as its congener, the Yellow-throated Scrub-Wren. On the northern side of the Hawkesbury River, I have usually observed it haunting the trees on the sides of creeks; but in the Illawarra District I once observed it in a tea-tree scrub on the beach. Like the Cat-bird, and other brush loving species, it is not found south of the Hawkesbury River until a similar vegetation flourishes about National Park, Waterfall, and Otford. South its range extends throughout the Illawarra District of New South Wales, into Eastern Victoria. Mr. Edwin Ashby has kindly forwarded me for examination an example obtained by him in Victoria, in July, 1886, in a fern gully at Boolarra, South Gippsland.

The food of the Large-billed Scrub-Wren consists entirely of small insects of various kinds and their larvae.

Relative to this species in the Bloomfield River District, North-eastern Queensland, Mr. Frank Hislop writes me: "The Large-billed Scrub-Wren is generally met with in the scrubby flats about the foot-hills, and is seldom seen at any height on the mountain ranges. It is one of the first birds to breed on the Bloomfield River, usually starting to build early in July. The nest is a dome-shaped structure, outwardly constructed of fibre and pieces of Lawyer-vine leaves, and lined inside with feathers. It is usually built in a Lawyer-vine, or among a tangled mass of creepers, close to the ground."

The nest is oval in form, with a rounded entrance in the side. Outwardly it is chiefly constructed of skeletons of various leaves and dried portions of leaves of the Lawyer-vine, the wall of the nest also being formed of the latter material, which is lined inside with fibre, and again at the bottom with feathers. An average nest measures externally seven inches and a half in height by four inches and a half in width, and across the entrance one inch. It is generally placed between several leafy stems of a Lawyer-vine or among dense vegetation.

Mr. H. R. Elvery, of Alstonville, near Ballina, from whom the nest described on the preceding page was received, drew my attention to the fact that the *Sericornis magnirostris* more frequently appropriated the deserted nest of another species than used one of its own construction. This I have since had frequent opportunities of verifying myself, and found that in every instance in my experience the abandoned nest of *Sericornis citreogularis* was used. At Ourimbah, on the 24th November, 1899, I found two nests of the latter species attached to drooping branches of a tree overhanging a creek. They were only three feet apart, and about seven feet from the water. On approaching close to them I could see that one, from which I flushed the female, was a new nest, and the other an old one, probably the nest of the previous season of the same pair of birds, but from which flew out *Sericornis magnirostris*. Both birds kept within a few yards of the nests, while I drew them towards me and examined them. In the former were three partially incubated eggs of *Sericornis citreogularis*, in the other two fresh eggs of *Sericornis magnirostris*. The nests, which I removed, were typical ones in form and material of *S. citreogularis*. On carefully pulling to pieces the old one, containing the eggs of *S. magnirostris*, I found that it had been freshly lined again at the bottom with feathers, and imbedded underneath was an egg of *S. citreogularis*, in which the contents had dried up; also abundant proof that young birds had been reared in the structure. Since then I have examined many nests from this district, also two from the Blue Mountains, in which the eggs of *S. magnirostris* have been deposited, and found in every instance that the deserted tenement of *S. citreogularis* had been relined and used. Personally I have never discovered or heard of an instance of *S. magnirostris* constructing a nest of its own in the Hawkesbury River and Illawarra Districts, or in the gullies of the Blue Mountains, and which is an entirely distinct and differently situated structure from that of *S. citreogularis*.

The eggs are usually three, sometimes four in number for a sitting. They are oval or swollen oval in form, the shell being fine, close-grained, and more or less lustrous. Typically in ground colour they vary from a faint purplish-white to light purple and pale purplish-brown, which is minutely freckled and marked with dark brown, or purplish-brown, particularly on the larger end, where, as a rule, a well defined zone or cap is formed. Some have small streaks—rarely blotches; others have very small but distinct caps or zones on the larger end only, and in several instances I have seen one egg in a set pure white and entirely devoid of markings. Among the different types of eggs of this species may be found some closely resembling typical eggs of *Sericornis frontalis* and *S. citreogularis*, but of course they are much smaller. A set of four, taken in the Tweed River District, measures as follows:—Length (A) 0.77×0.57 inches; (B) 0.73×0.57 inches; (C) 0.77×0.55 inches; (D) 0.76×0.56 inches. This set also contained an egg of the Fan-tailed Cuckoo. A set of three, taken at Ourimbah, measures:—Length (A) 0.73×0.57 inches; (B) 0.73×0.55 inches; (C) 0.75×0.55 inches.

Young birds may be distinguished by having the upper parts olive-brown, the forehead and sides of the head buff, throat pale buff, and the remainder of the under surface pale buff tinged with olive.

Frequently the task of incubating the egg and rearing the young of the Fan-tailed Cuckoo, devolves upon this species. At Ourimbah, on the 27th November, 1901, I watched for some time a young Fan-tailed Cuckoo being fed by a pair of Large-billed Scrub-Wrens. Apparently its wants were never satisfied, although the diminutive foster-parents were assiduous in their attention to it, for I heard its incessant cries for food during a long time that I remained in the neighbourhood.

In North-eastern Queensland the breeding season usually commences in July and continues until the end of January. In the northern coastal scrubs of New South Wales, it begins a month later. In the Hawkesbury River and the Illawarra Districts, eggs are seldom obtained before the middle of November, and on the Blue Mountains I have seen fresh eggs that were taken early in January.

Sericornis maculata.

STRIATED SCRUB-WREN.

Sericornis maculatus, Gould, Proc. Zool. Soc., 1817, p. 2; *id.*, Bds. Austr., fol., Vol. III., pl. 51 (1869); *id.*, Handbk. Bds. Austr., Vol. I., p. 361 (1865).

Sericornis maculata, Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 307 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 221 (1903).

ADULT MALE—*General colour above olive-brown, becoming a clearer and brighter olive on the rump and upper tail-coverts; upper wing-coverts like the back, the outer series of the median and greater coverts black tipped with white; primary-coverts and bastard-wing feathers black, the latter broadly margined with white on their apical portion; quills brown, the primaries edged with ashy-white on their outer webs, the secondaries broadly margined with olive-brown; tail olive-brown, crossed by a subterminal blackish band on all but the two central feathers, the lateral feathers margined with white at the tip of the inner web, a narrow frontal band and a triangular shaped patch in front of the eye black; superciliary stripe and a small spot below the eye white, the former bordered above with a narrow line of black feathers; ear-coverts ashy-brown; chin and cheeks white; throat and fore-neck greyish white with a blackish streak down the centre of each feather, the chest similar but less distinctly marked and washed with yellow; breast and abdomen pale yellow; sides of body olive-brown, the flanks and thighs slightly darker; under tail-coverts pale yellow, with short indistinct brownish streaks in the centre of some of the feathers. Total length 7.4 inches, wing 2.15, tail 1.9, bill 0.48, tarsus 0.8.*

ADULT FEMALE—*Similar to the male, but having the lores dusky-brown instead of black, and the black streaks on the throat and fore-neck less pronounced and not extending quite so low down on the chest.*

Distribution.—Western Australia, South Australia, Kangaroo Island.

THE Striated Scrub-Wren is an inhabitant of Western and South Australia, and some of the adjacent islands. Although tolerably numerous in the former State, it is extremely rare in South Australia. It does not occur in Victoria, New South Wales, and the interior of the Australian continent, as recorded by Dr. Ramsay. The eggs collected by the late Mr. K. H. Bennett near Mossgiel in October, 1883, and at Mount Manana, in Western New South Wales, on the 9th September, 1885, and attributed by Dr. Ramsay to this species, proved, on receipt of a skin obtained at the nest found at Mossgiel, to be those of *Ptycholamus brunneus*. Collecting at King George's Sound, Western Australia, on behalf of the Trustees of the Australian Museum, Mr. George Masters was successful in obtaining eighteen adult specimens, also the nest and eggs of this species. Mr. Masters also procured two adult specimens at Port Lincoln, South Australia, in September, 1865. From the South Australian Museum, Adelaide, I have also received for examination a specimen obtained by Dr. Angove at Queenscliff, on Kangaroo Island, in 1901.

Gould remarks of this species:—"The present bird, to which I have assigned the specific term of *maculatus*, has always been a source of perplexity to me, from the circumstances of its varying considerably in its markings; after mature consideration, however, I am inclined to regard the specimens from Southern and Western Australia, and the north coast, as referable to one and the same species, each, however, possessing trivial differences by which it may be known from where it was received. Specimens from the Houtman's Abrolhos are of a rather smaller size, of a much greyer tint on the back, and have much darker coloured legs. I believe that the bright yellow wash on the under surface of some individuals is characteristic of newly-moulted birds." The series of birds now before me amply justifies Gould's remarks. Some

* Tab. List. Austr. Bds., p. 9 (1888).

† Handbk. Bds. Austr., Vol. i., p. 361 (1865).

specimens collected by Mr. Masters at King George's Sound have the chest and breast pale yellow, in others these parts are almost pure white. Those from Port Lincoln, South Australia, have the upper surface less distinctly washed with olive, and the adult male procured by Dr. Angove on Kangaroo Island has the general colour above tinged with dark ashy-grey, and agrees more with the insular form described by Gould from Houtman's Abrolhos.

The nest is a dome-shaped structure, with a rounded entrance in the side, and is formed of strips of bark, rootlets and grasses, warmly lined inside with feathers, and was placed in scrubby undergrowth near the ground. The eggs are two or three in number for a sitting, oval in form, the shell being close-grained, smooth, and lustrous. They vary from a faint buffy to a dull greyish-white ground colour, which is minutely freckled and streaked with dark purple and slaty-grey, the markings being more thickly disposed towards the larger end. They measure:—Length (A) 0.78×0.54 inches; (B) 0.79×0.55 inches; (C) 0.78×0.56 inches. A set of two, taken by Mr. Masters at King George's Sound, in December, 1868, are of a greyish-white ground colour, slightly tinged with buff, and freckled with a slightly richer shade of the ground colour, the markings becoming confluent and darker on the larger end, where in one specimen they form a clouded cap, and in the other a small but well defined zone: Length (A) 0.8×0.55 inches; (B) 0.78×0.55 inches.

Sericornis humilis.

SOMBRE SCRUB-WREN.

Sericornis humilis, Gould, Proc. Zool. Soc., 1847, p. 133; *id.*, Bds. Austr., fol., Vol. III., pl. 47 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 356 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 310 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 222 (1903).

ADULT MALE—*General colour above rich olive-brown, with a rufescent tinge which is more pronounced on the lower back and rump; upper wing-coverts like the back, the outer series of the greater coverts blackish narrowly edged with white at the tip of the outer web; primary-coverts black; bastard-wing black, margined with white at the tip of the inner web; outer webs of the quills olive-brown with a rufescent tinge, the inner webs blackish-brown; upper tail-coverts and tail reddish-brown; feathers below and in front of the eye dusky-blackish, above which is a narrow dull white stripe not extending beyond the eye; chin and cheeks whitish, indistinctly mottled with blackish-brown; sides of the neck like the back; throat dull white with blackish centres to the feathers; fore-neck pale yellow, with indistinct dusky centres to the feathers; chest, breast, and abdomen, pale yellow, the former and the sides of the body light reddish-brown; "bill dark brown; legs and feet dark fleshy-brown; iris buffy-yellow" (Atkinson). Total length in the flesh 6 inches, wing 2.5, tail 2.1, bill 0.56, tarsus 1.*

ADULT FEMALE—*Similar in plumage to the male, but having the feathers around the eye ashy-brown, the supraloral white stripe only faintly indicated, and the feathers on the throat dull greyish-white, with indistinct dusky-brown centres.*

Distribution.—Tasmania, and some of the larger islands in Bass Strait.

THIS species is generally distributed in favourable situations over most parts of Tasmania, and it also inhabits some of the larger islands in Bass Strait. There are specimens in the Australian Museum collection, obtained by Mr. George Masters in May, 1867, at Newtown Creek and Mount Wellington, in Southern Tasmania, also others procured near Launceston. Dr. L. Holden has found numbers of its nests, with eggs or young, on the north-western coast of Tasmania; so also has Mr. R. N. Atkinson, at Waratah, a tin-mining township at the foot of Mount Bischoff, about sixty miles in a direct line west from Launceston.

Stomachs I examined of birds received in the flesh from Mr. Atkinson in June, 1902, contained the remains of insects and seeds. Others had seeds only and a few pieces of gravel. The walls of the stomach are thick and muscular.

From notes made by Dr. L. Holden while resident at Circular Head, Tasmania, I have extracted the following:—"On the 20th August, 1886, in a dense shrub, seven feet from the ground, I found a nest of *Sericornis hamilis*, with two eggs. It was a domed-shaped structure, with a side entrance, formed of dry grass, fragments of bark, and thickly lined with feathers. Usually they are built close to the ground. Near Circular Head I found another nest of this species on the 20th October, containing three eggs. It was built in the bushy top of a dead half fallen tea-tree, being well concealed by the leafy twigs, and was fully five feet from the ground. This nest was outwardly formed of dry grass, bark, and dead leaves, and the interior was lined with feathers. Two days later I found a nest built in a tussock, about eighteen inches from the ground, containing three newly fledged young; and in the following week another, in a similar position, with three young; also two nests, each containing two eggs. On the 23rd August, 1887, I found two nests built in a tangle at the foot of tea-trees. They were between two and three feet from the ground, and each contained two eggs. Three days later I took one egg from each nest. These nests must have been begun at the end of July. One of them looked so much like a last season's nest that I plucked it from its site and carried it some yards in that belief. I carefully replaced it, and visiting these nests again on the 31st August, found each of the remaining eggs hatched. On the 31d September I came across two newly-fledged young in some tea-tree scrub, but could not find the nest. The parents chattered anxiously, but they did not feign lameness, although one perched within a few inches of my face in its anxiety to attract my attention. On the 30th August, 1888, I found a nest in the village paddock with two eggs almost hatched. The nest was placed near the edge of some open scrub, and built absolutely on the ground, being protected and hidden by a few dried twigs and blades of grass."

With several nests and sets of eggs of this species, received from Mr. R. N. Atkinson, he sent the following information:—"At Waratah, Mount Bischoff, *Sericornis hamilis* is generally met with in the undergrowth or on the ground. When in search for food, it may be seen hopping over or under logs, flitting about from stone to stone, or in and out of the young Beech-trees (*Fagus cunninghamii*), locally called 'myrtles,' and of which the forests here are principally formed. I have seen these birds eat insects and their larvæ, also worms. The nest is usually built in a low bush close to the ground, sometimes by the side of a log. It is generally well concealed, and although I found one conspicuously placed on top of a cut rush clump, I have more often found them by watching the birds. Three eggs are laid for a sitting, and the breeding season commences here in August, and continues until the end of December. I have found the nest of this species in August, when there was a foot deep of snow on the ground."

The nest is domed, or nearly spherical in form, with a small rounded entrance in the side. It is outwardly formed of coarse grasses and their sheaths, intermingled with a small quantity of bark fibre and green mosses; the inside is lined with fine grasses, bark fibre, and a thick layer of hair, fur, and feathers; in the nests now before me, are a number of feathers from the Yellow-bellied Parrakeet. An average nest measures seven inches and a half in height, by five inches and a half in diameter, and across the entrance one inch and a quarter.

The eggs are two or three in number for a sitting, oval, thick oval, or elongate-oval in form, the shell being close-grained, smooth and slightly lustrous. The ground colour varies from pale purplish-buff to purplish-white, and has numerous minute freckles, scratches, or irregular-shaped markings of umber or purplish-brown, confined as a rule to the thicker end of the shell, where the markings are confluent and form a more or less well defined cap or zone. Occasionally specimens are found almost pure white, or having only a few isolated

irregular-shaped markings of amber or pale purplish-brown on the thicker end. A set of two, taken on the 6th October, 1886, by Dr. Holden, at Circular Head, measures:—Length (A) 0.85×0.65 inches; (B) 0.84×0.67 inches. A set of three, taken on the 31st August, 1899, by Mr. R. N. Atkinson, at Waratah, measures:—Length (A) 0.92×0.66 inches; (B) 0.93×0.65 inches; (C) 0.9×0.65 inches. A set of three, taken in the same locality, on the 12th October, 1899, measures:—(A) 0.93×0.7 inches; (B) 0.93×0.7 inches; (C) 0.92×0.7 inches.

July, and the five following months, constitute the usual breeding season of this species.

Genus PYRRHOLÆMUS, Gould.

Pyrrholæmus brunneus.

RED-THROAT.

Pyrrholæmus brunneus, Gould, Proc. Zool. Soc., 1840, p. 173; *id.*, Bds. Austr., fol., Vol. III., pl. 68 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 384 (1865).

Sericornis brunnea, Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 302 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 220 (1903).

ADULT MALE—*General colour above brown; the lower back, rump, and upper tail-coverts brown washed with olive; upper wing-coverts brown, the greater series with paler brown margins; quills brown, the primaries narrowly edged externally with brownish-white; tail feathers blackish-brown, with paler brown margins, the four outermost feathers on either side being largely tipped with white; forehead blackish-brown, with broad dull whitish margins to all the feathers; lores, and a narrow indistinct eyebrow dull white, the feathers at the base of the upper mandible having a rufous wash; sides of the face and neck ashy-grey; ear-coverts brown; chin and centre of the throat rufous; fore-neck and chest ashy-grey; centre of the breast and abdomen dull white; thighs brown; sides of the breast, abdomen, and under tail-coverts sandy-buff; bill black, the lower mandible horn colour except at the tip; legs and feet black; iris light brown* (Morgan). Total length 4.5 inches, wing 2.2, tail 1.5, bill 0.4, tarsus 0.8.

ADULT FEMALE—*Similar in plumage to the male, but having the chin white and the centre of the throat ashy-grey instead of rufous.*

Distribution.—New South Wales, Victoria, South Australia, Central Australia, Western Australia, North-western Australia.

THE Red-Throat, a name which is applicable to the male only, is widely distributed over the dry inland portions of Southern Australia. Gould, who described the type, states that he found it "tolerably abundant in the belts of the Murray, about fifty miles to the northward of Lake Alexandrina, in South Australia." There are specimens from Port Augusta in the Australian Museum collection, also unlocalised examples from other parts of South Australia. Mr. James Ramsay found its nest and eggs at Tyndarie, in Western New South Wales, in September, 1880; and in the same State the late Mr. K. H. Bennett, in October, 1883, procured birds, nests, and eggs, in the arid scrubs of the Mossgiel District, and again in September, 1885, at Mount Manara. It was met with by members of the Horn Scientific Expedition in Central Australia in 1894; and at Illamurta, Mr. C. E. Cowle has on many occasions found its nest and eggs. Gilbert procured specimens in Western Australia, so likewise did the members of the Calvert Exploring Expedition, but the skins were abandoned with the remainder of the first collection, near Johanna Springs. In August, 1901, Mr. Edwin Ashby obtained specimens and saw numerous examples at Callion, about eighty-five miles north of Coolgardie, Western Australia, and three hundred miles from the coast. Mr. W. D.

Campbell, of the Geological Survey of Western Australia, also found it breeding in October, 1901, near Hannan's Lake, and forwarded its nests and eggs to the Trustees of the Australian Museum. At Point Cloates, North-western Australia, Mr. Tom Carter informs me that it occurs both near the coast and inland, although it would not be much noticed but for its beautiful song.

Mr. G. A. Kearnland sends me the following notes:—"Red-throats (*Pyrholaemus brunneus*) are modest-plumaged little birds, but beautiful songsters. I first saw them near Alice Springs, in Central Australia, in thick mulga scrub. They were very tame, and whether among the branches of the low bushes, or hopping about the ground in search of small insects, they keep up a constant twitter. They were again seen in Western Australia, along the Cue road, and up to the neighbourhood of Lake Augusta, but were not noticed in the north of the desert. Wherever these birds exist, their notes soon betray their presence. They breed in low bushes, making a nest much like that of a *Malurus*, and lay three or four eggs for a sitting."

Dr. A. M. Morgan noted this species as being fairly common between Port Augusta and Mount Gunson, in South Australia, and found a pair building on the 14th August, 1900, at Port Augusta, in a depression in the ground under a thick bush. During a trip he made to the Gawler Ranges in August, 1902, and again, in company with Dr. Chenery, an adult female of this species was obtained, which he kindly sent me with the following note:—"Pyrholaemus brunneus was common wherever there was any cover at all. A female, shot on the 12th August, at Wippipipce, had a grey throat. While watching some *Maluri*, a pair came quite close to me, one of which had a red, the other a grey throat; both were singing, taking it in turns. They are beautiful songsters. The song is like that of *Arreophalus*, but is not so loud, and is more sustained. The note of the female is similar to but harsher than that of the male. They are shy birds, and as a rule require a good deal of stalking to secure specimens."

The nests of this species vary somewhat in size and in the materials of which they are formed. One now before me, found by Mr. W. D. Campbell on the 27th October, 1901, on the eastern side of Hannan's Lake, in Western Australia, is spherical in form, with a rounded entrance in the side, and is outwardly formed of very long thin strips of bark and bark fibre, intermingled with fine dried grasses and warmly lined inside with feathers. This nest was built in the stems of a low bush, close to the ground, and contained three fresh eggs. It measures externally four inches in diameter, and across the entrance one inch. Another one, taken by Mr. C. E. Cowle in August, 1899, at Ullamurta, Central Australia, is likewise spherical in form, but is constructed throughout of dead soft dull grey grasses, and has no other lining; it averages five inches and a half in external diameter. With this nest Mr. Cowle sent the following note:—"I took the Red-throat's nest at the foot of a dead *Cassia* bush; it was about eight inches off the ground, on some dry grass, and contained three eggs, but I have found them with four. At first sight I took it for a Chestnut-eared Finch's nest, but the latter birds here always use a straw-coloured material for the construction of their nests. I found another nest the same day, built in dead spinifex, containing three fresh eggs."

The eggs are three or four in number for a sitting, oval or elongate-oval in form, the shell being close-grained, smooth, and more or less lustrous. The ground colour varies from olive-brown to clove-brown, and dark brown slightly tinged with purple to purplish-brown, some specimens being uniform in colour, but as a rule having a clouded zone or cap on the larger end, of a darker shade of the ground colour. A rare variety is of a faint purplish-grey ground colour, with an indistinct zone on the larger end formed of numerous fleecy markings of purplish-brown. I have also seen specimens of an olive-brown ground colour, with a well defined blackish band on the larger end. A set of three, taken on the 18th September, 1880, at Tyndarie, New South Wales, by Mr. James Ramsay, measures as follows: Length (A) 0.78 x 0.58 inches; (B) 0.79 x 0.58 inches; (C) 0.78 x 0.59 inches. A set of three, taken in

April, 1898, at Illamurta, Central Australia, by Mr. C. E. Cowle, measures. (A) 0.75 × 0.56 inches; (B) 0.70 × 0.57 inches; (C) 0.72 × 0.54 inches.

Nests with eggs are more often found in New South Wales during August and the two following months, but in Central Australia the breeding season usually commences after a heavy downfall of rain in March and April. Mr. Cowle has also obtained nests with eggs early in December.

Several of the sets of eggs of *Pyrhulemus brunneus* received from Mr. Cowle, and taken by him in Central Australia, each contained an egg of the Black-eared Cuckoo (*Misocalius palliolatus*). Since I described the egg of the latter species, Mr. A. Zietz, the Assistant Director of the South Australian Museum, wrote me as follows:—"It may interest you to learn that I received in 1893 from Mr. R. Hawker, an egg of the Black-eared Cuckoo (*Misocalius palliolatus*, Lath.), which he found in a nest of *Pyrhulemus brunneus*, at Parallana, Flinders Range, South Australia. Two eggs from the nest of the latter species, Mr. Hawker also sent with it. The egg of the Black-eared Cuckoo agrees in colour and size with your description in the 'Report of the Horn Scientific Expedition,' and may be described as chocolate-brown with a rusty tinge. Mr. Hawker has often noticed the Black-eared Cuckoo, in the neighbourhood of Parallana."

Genus PYCNOPTILUS, Gould.

Pycnoptilus floccosus.

PILOT-BIRD.

Pycnoptilus floccosus, Gould, Proc. Zool. Soc., 1859, p. 95; *id.*, Handbk. Bds. Austr., Vol. I., p. 348 (1865); *id.*, Bds. Austr., fol., Suppl., pl. 27 (1869); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 342 (1883); *id.*, Handl. Bds., Vol. IV., p. 4 (1903).

ADULT MALE—General colour above brown, with a rufescent wash which is more pronounced on the lower back, rump, and upper tail-coverts; tail rufescent-brown; upper wing-coverts like the back, the outermost feathers of the median and greater series with an indistinct ochraceous-brown spot at the tip; quills dark brown, with a rufescent wash on their outer webs, which extends all over the innermost secondaries, also the greater wing-coverts; ear-coverts brown; lores and forehead rufescent-ochre; feathers above and below the eye, the cheeks, throat, and breast, similar in colour, but with a less pronounced rufescent shade, the feathers of the upper breast having brown centres, giving this part a scaly appearance; centre of the breast white; abdomen and flanks rufous-brown; under tail-coverts chestnut; bill dark brown, base of the lower mandible pale brown; legs dark reddish-brown, the feet of a slightly deeper tint; iris brown. Total length in the flesh 6.5 inches, wing 2.75, tail 2.75, bill 0.5, tarsus 1.15.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—New South Wales, Victoria.

THE Downy Pycnoptilus, or Pilot-bird, is an inhabitant of the heavily-timbered mountain ranges and humid scrubs of Eastern Victoria and South-eastern New South Wales. During my first visit to South Gippsland, Victoria, in August, 1878, these birds were unusually plentiful in the luxuriant undergrowth that clothed the sides of the fern gullies and hills of the Strzelecki Ranges. At that time only a few clearings had been made in the virgin growth of this part of the State, and as one slowly toiled along the track through the mud on horseback, the rich and beautiful notes of this species would be more frequently heard than the bird itself was seen. Subsequently I found it by no means a shy species, and the animated little puffy

* Rep. Horn. Sci. Exped., Vol. ii., Zool., p. 65 (1896).

brown ball of feathers often ventured on to a track, threw back its head, and poured forth its oft-repeated clear double note while I was seated only a few feet away. The difficulty was to get far enough away from the bird, without losing sight of it, if one wanted to procure a specimen. In habits it resembles *Sericornis frontalis*, passing most of its time upon the ground hopping in and out of the tangled masses of vegetation, sometimes out on a clearing, or among the fallen and decaying timber in search of insects, which constitute its food. Two nests were found during my second visit, at Childers, in October, 1878, built on the ground among low ferns, and each containing two fresh eggs. For many years in this neighbourhood, and between Yarragon and the Narracan River, it was, with the exception of *Sericornis frontalis*, one of the commonest ground-frequenting species haunting these humid localities, but the clearings made by selectors and bush fires eventually drove most of these birds to a more thickly wooded and secure retreat. In similar country Mr. Joseph Gabriel has found these birds breeding at Bayswater, in the Dandenong Ranges, Victoria. Their range in favourable situations extends throughout the coastal ranges of Eastern Victoria into the humid scrubs and mountain gullies of the Illawarra District of New South Wales. Mr. J. A. Thorpe and Mr. J. Yardley obtained specimens at Cambewarra, where it was also found breeding by Mr. Sinclair, a timber-getter, in November, 1886, the nest and eggs together with the parents being forwarded to the Trustees of the Australian Museum. Mr. Thorpe had, however, previously obtained specimens near Helensburgh in May, 1881; and in September, 1893, the Curator (Mr. R. Etheridge, Junr.), and Mr. Thorpe met with this bird in the deep gullies running down to the sea-shore at Gera, on the south-eastern confines of the National Park. On the Blue Mountains Mr. Robt. Grant first procured these birds at Lithgow in 1878, and since that time he informs me that he has obtained between forty and fifty specimens, and found two of their nests. One, built in some débris a few yards away from the edge of a creek bank, contained a single fresh egg, but on visiting the place a week later he found that the nest and surroundings had been destroyed by a bush fire. The other, built close to a fallen log, contained two young ones. He also met with this species in a deep gorge between Wallerawang and Mudgee, the northern limit of its known range. Of a series of seventeen adult specimens now before me, twelve were obtained by Mr. Grant in the vicinity of Lithgow. I have also heard this species in the Kanimbla Valley, and near the Katoomba, Leura, and Wentworth Falls. Some, which I take to be very old birds, are much darker and richer in colour than others, the ear-coverts are rufescent-ochre like the lores, and the outermost feathers of the median wing-coverts have no ochraceous-brown tips; in others the ear-coverts are brown and have the basal portion only rufescent-ochre. The wing-measurement of adult males varies from 2.6 to 2.9 inches.

Detailing his experience of the nesting-habits of this species, Mr. Joseph Gabriel sent me the following notes with a nest and two eggs he had taken at Bayswater, Victoria, on the 8th December, 1897:—"Pilot-birds, when building their nest, do not travel far for material, and work very rapidly, hence they finish their nest in a few days. This I know to my sorrow, for I lost the eggs from the first nest I found through over-sitting. As far as I have observed, these birds do not confine themselves to breeding near creek banks. Three nests which were found for me by my friends, were all well up on the hill-side; one was cosily placed at the base of a fern (*Aspidium aculeatum*); another, which I am sending you, was built under the shelter of some undergrowth several hundred yards away from water; the third was built in my friend's garden, close to the house, and much to my chagrin was never laid in. I found another nest on the 8th December, containing two young. When these birds are building is the best time to locate their nests, except of course when feeding their young."

The nest is a rather large and loosely-built dome-shaped structure, with an oval entrance in the side. It is outwardly formed of very thin strips of bark and bark-fibre, with which is intermingled a few dead eucalyptus leaves, and the black hair-like roots of a tree-fern. Inside it

has a very thick layer of bark-fibre, and at the bottom of the nest a warm lining of feathers. The nest forwarded by Mr. Gabriel is lined principally with the long downy feathers from the flanks of the Lyre-bird, and also some from the Yellow-breasted Robin. Externally it measures five inches and a half in width by four inches and a half in height, and across the entrance one inch and a quarter.

The eggs are two in number for a sitting, and vary from swollen to elongate-oval in form, the shell to the naked eye being apparently close-grained, smooth, and more or less lustrous, but when examined with a lens numerous pittings will be found over the entire surface, which are more pronounced in some specimens than others. In ground colour they vary from drab to smoky-brown and dusky-grey, being as a rule darker on the larger end, where there is a more or less distinct band formed of small confluent spots or fleecy markings of a darker shade of the ground colour. Others are uniform in colour, while some have ill-defined blackish irregular-shaped spots and dots distributed over the entire surface of the shell. On looking closely into the eggs of this species, the ground colour in some specimens appears to be cracked in fine faint undulating rings, quite encircling the shell. Others have the narrower half of a distinctly lighter shade of the ground colour, and in marked contrast to the remainder of the shell. A specimen now before me has a broad wreath of blackish dots and spots on the larger end, enclosing a much smaller and less distinct band on the top of the egg. An egg of a set of two, taken at Childers, South Gippsland, Victoria, in October, 1878, measures:—Length 1.04×0.73 inches. A set of two, taken at Cambewarra, New South Wales, in November, 1886, measures:—Length (A) 1.07×0.8 inches; (B) 1.1×0.77 inches. A set taken at Bayswater, Victoria, on the 8th December, 1897, measures: Length (A) 1.1×0.77 inches; (B) 1.07×0.8 inches.

October and the three following months constitute the usual breeding season of this species.

Genus ORIGMA, Gould.

Origma rubricata.

ROCK WARBLER.

Sylvia rubricata Lath., Ind. Orn., Suppl., p. lv., (1801).

Origma rubricata, Gould, Bds. Austr., fol., Vol. III., pl. 69 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 385 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 135 (1883); *id.*, Handl. Bds., Vol. IV., p. 207 (1903).

ADULT MALE—*General colour above dark ashy-brown, the rump slightly tinged with rufous; upper tail-coverts blackish; upper wing-coverts like the back; quills dark brown; tail feathers blackish; head dark ashy-brown; forehead and feathers in front of and around the eye washed with rufous; ear-coverts dull rufous-brown; feathers of the chin and throat greyish-white with blackish bases; remainder of the under surface dark ferruginous, and washed with brown on the flanks and thighs; under tail-coverts dark brown with a ferruginous wash which is more conspicuous on the edges of the feathers; bill brownish-black; legs and feet brownish-black; iris reddish-brown. Total length in the flesh 5.6 inches, wing 2.65, tail 2.3, bill 0.5, tarsus 0.9.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—New South Wales.

SO far as I have observed, the northern and central portions of Eastern New South Wales constitute the exclusive habitat of this species. Nowhere is it more abundantly distributed than in the numerous rocky ravines and gullies lying between the Hawkesbury River and Port Jackson; its range extending in a southerly direction into the Illawarra District, and west to the gullies of the inland slopes of the Blue Mountains.

During the past seven years, in the neighbourhood of Middle Harbour and Lane Cove River, I have had frequent opportunities of observing the habits of this species. It is usually met with in pairs, and resorts chiefly to the vicinity of rocky ravines and gullies, and is never found far away from permanent water. In actions it is extremely lively, and it passes with great rapidity over the surface of rocks and fallen logs. Only on two occasions have I seen it perch on a branch, and then when I was in the vicinity of their nests.

It is strictly insectivorous, and most of its food, which consists of small moths, is captured in the crevices of rocks.

The clear notes of this bird, which are uttered at intervals, resemble those of *Scornicoris frontalis*, more than any other species, but are much louder.

Caley's vernacular name of "Cataract-bird" is a more appropriate one for this species than that of "Rock Warbler," for its nests are almost invariably built in close proximity to running water, and it cannot by any means be regarded as a warbler. During the late spring and summer months, when many of these small mountain rivulets cease to run, these places are abandoned by the birds for more favoured localities, water apparently being essential.

Owing to the peculiar situations resorted to by these birds as nesting-sites,—several within half-a-mile of my house,—I have paid particular attention to their nesting habits.

The nest of the Rock Warbler is a dome-shaped structure with a rounded entrance in the side, occasionally more or less protected with a hood. The walls are formed of short strips of bark or bark-fibre, which are externally coated with fine green moss and a slight addition of cob-web and the silky covering of the egg-bags of spiders. As a rule, at the bottom of the nest inside, it is sparingly lined with feathers; but several I have examined, containing eggs, were lined only with fine bark-fibre. An average nest, found by me at Roseville, measures ten inches in length by four inches and a half in breadth, and across the entrance one inch and a quarter. The upper portion of the nest, where it is attached to the ceiling of the cave, is formed almost entirely of cob-web. In some nests there may be two or three inches of the upper portion fastened to the rock; in others I have seen the top run to a point no thicker than a pen-holder. Typically there are only a few inches of nesting material above the domed portion of the nest, but it varies in length considerably, even in nests built by the same pair of birds. A nest taken by Mr. R. Grant, at Lithgow, was abnormally long and measured three feet over all. The upper portion of it was very thin, and it is remarkable that the material of which it was formed did not pull asunder by the weight of the nest. The nest is usually attached to a flake of rock in the roof of a cave or rock-shelter, and preferably in those close to running water. The nests I have found were mostly built in partially darkened chambers, sufficiently large to walk into erect, or in a slightly stooping posture; others in crevices I could just manage to crawl into; and one where the entrance was only a foot from the ground. A favourite place, judging by the nests found at various times, and the remains of others, was under the rocky sides of a deep well-like hole in the bed of a creek near Middle Harbour. Around this place, which resembled the crater of an extinct volcano, one could walk in a slightly stooping position or crawl for a distance of fifteen to twenty feet, and in the most obscure parts of it the nests were built. Low shallow rock-shelters, over which water continually drips, partially hidden by low ferns and other moisture-loving vegetation, are used as nesting-sites; also cavities formed by large masses of rock placed one against another. About coal-mining localities in the Blue Mountains, it is frequently fastened to the timbers in the roof of disused tunnels. At Jenolan there is one attached to a stalactite in the Nettle Cave. Once I found two nests within a foot of each other, but one was, judging by its appearance, probably the work of the same pair of birds during the previous season. As a rule they are built within a few feet of the ground, and seldom out of hand's reach. I have never found more than one tenanted nest in the same cave or rock-shelter. I found the very same nesting-

site resorted to for several seasons, and presumably by the same pair of birds. An unusual nesting-site was one I discovered by seeing both birds enter with nesting-material into a small chamber formed by boulders on the top of a hill, and away from water. On the 7th October, 1902, a fortnight later, the nest was complete and contained three fresh eggs.

The scene represented here is reproduced from a photograph I took of a haunt frequented by a pair of Rock Warblers, not far from my house. Beneath the largest of the three rocks



NESTING-HAUNT OF THE ROCK WARBLER.

on the right-hand side is a chamber about six feet high at the entrance, and four feet in width, of which a glimpse may be seen in the small dark acute-angled patch at the junction of the lower and the middle rocks. This chamber extends back for about fifteen feet, and has a small exit in the rear; the greater part of the floor is covered with water, and entirely so during some months of the year. The roof slopes upwards, and on the same flake of rock this pair of birds have constructed their nest for the last five years. I did not visit it in the spring of 1903, but on going to photograph the spot on the 19th April, found the nest in the usual

place, which contained portions of shell of Rock Warbler's eggs, and abundant proof that young birds had been in the nest. At that time, after a comparatively dry summer, there was only a small trickling stream in the creek, but usually in September, when these birds breed, there is a large and rapid flow of water covering the entire bed of the creek. I heard the birds in the neighbourhood while engaged in photographing.

In a large number of nests examined, I found that three eggs were invariably laid for a sitting, except when a Fan-tailed Cuckoo deposited her egg in the nest when never more than two eggs of the Rock Warbler were found. The eggs vary from oval to rounded and elongate, and in form they are all being described, smooth and slightly lustrous. When fresh, the white of the egg is apparently smooth, but after being emptied of their contents are pure white. Several sets taken especially to examine, contained an egg of the Fan-tailed Cuckoo, but the other contents of the eggs sparsely peppered or dusted with almost invisible markings of pinkish red. A set of two taken by Mr. Frank Hsieh at Laling-mo, on the 18th September, is as follows as taken from a nest: B. 1.87 x .62 inches; C. 1.85 x .60 inches. Another set taken at the same place at Malan Hall on the 25th October, 1906, are as nest: A. 1.88 x .60 inches; B. 1.88 x .60 inches; C. 1.76 x .60 inches. A set of two taken from the same nesting place on the 31st October, 1906, and were also found to contain an egg of the Fan-tailed Cuckoo, are as nest: A. 1.76 x .60 inches; B. 1.88 x .62 inches.

On the 10th October, 1906, I found a nest in a gully at Ch'ang-shan-shi. My attention was directed to it by seeing one of the birds flying over it, its bill dropped behind some rocks and then dropping into a small pool of water, and it was near a small waterfall, and on reaching an overhanging rock, it was seen to be covered with water, the nest was discovered and taken out. On a ledge of rock overhanging the pool, I found a young Fan-tailed Cuckoo. The nest of the Rock Warbler contained two eggs at the same time. On securing the young Cuckoo, it perched on the side of the pool, then it stepped into it at the same time uttering a series of distress and warning notes, but as I could not get within range to catch them. Knowing that the Rock Warblers, the parents of this pair in the gully, would build again in the same old place, I put the eggs in a box and took them to the station, accompanied by Mr. S. W. Moore. I was going down the creek to a distance of more than a hundred yards from their previous nesting place, the latter I secured them partially built in a small rocky cavern in the bed of the creek, and as soon as the water was flowing in the gully. We watched the spot for some time, but being unable to get near the birds, all the while, I did not see them enter the nesting-place. On going to the entrance, we saw one of the birds enter the nest in its bill close to the nest, its bill quickly dropped and it disappeared into the small cavity at the back of the cavern. On examining the nest, it contained one entire and one single egg, which by its size I judged to be a Fan-tailed Cuckoo's, but as the nest did not appear to be quite finished, did not take it out to examine it. Visiting the nest again on the 22nd inst. I found it contained three eggs. The third egg proved to be as previously surmised, an egg of the Fan-tailed Cuckoo. The eggs were returned to the nest, and I visited it again on the 29th inst. The female was sitting, and allowed me to get within a yard of the nest before leaving it. It still

contained only two eggs of the Rock Warbler, in addition to the Cuckoo's, and as they were all slightly incubated I took them. The female was exceedingly tame, and while I was at the nest hovered several times within a few feet of me. This nest was built of very soft material throughout, chiefly with shreds of bark, fine rootlets, mosses, and cobwebs. It had no lining of feathers, which was probably due to the egg of the Fan-tailed Cuckoo being deposited before it was quite finished. On the 24th October, and for the third time during that month, I found the nest of this same pair of birds. It was attached to a portion of the old nest left in the cave where the young Cuckoo was caught on the 3rd inst. Owing to my leaving for the country, no opportunity occurred of visiting this nest for several weeks, but Mr. C. G. Johnston, who was with me, examined it on the 6th November, and found it contained one egg of the Rock Warbler and one of a Fan-tailed Cuckoo. On visiting it again on the 12th inst. he found that some one had removed the eggs.

The Rock Warbler had not been included among the foster-parents of any of the Cuculidae prior to my discovery of a young Fan-tailed Cuckoo near one of their nests. That it was not,

been in a solitary instance of *Salpinctes obsoletus* examining the nest of a *Rock Warbler*. This species was proved by my frequently finding the eggs of this Cuckoo in the nests of the latter.

Nidification in the Rock Warbler takes place in August (beginning in September) and the nest is usually completed in fifteen to seventeen days. These birds are exceedingly wary during nest-building when an intruder ventures near, stopping quietly behind the bushes and the male warblers use the narrow entrance at the back if there is one sufficiently large to admit them. In some instances, however, four and even five birds may be before a nest was completed. On the other hand, if a pair of birds take their nest seven or eight days usually I can return ten or twelve days later and find about as much as at Middle Harbour in the first instance. In 1901, I examined three partially incubated eggs in the first of these. Six days later one of the birds flew out of an adjoining recess as I entered into the nest on my hands and knees. I then fastened the entrance and the nest as usual, and in the evening I flushed the female as she sat on three slightly incubated eggs. This nest was in a very deep hole, the entrance small and very large, and the inside of the entrance containing the eggs was very uneven and a tad in depth. Only three weeks had elapsed since taking the previous set of eggs from this pair of birds. On the 1st September of the following year, I found the nest in a similar position and took from it two fresh eggs of the Rock Warbler. On the 12th September, and three weeks later, on the 15th of October, I found the Fan-tailed Cuckoo. On the same date I flushed the female Rock Warbler from a nest in the open side of the cave containing two of her eggs and one of the Fan-tailed Cuckoo.

A nest found on the same day, on the 12th August, contained, on the 1st October, a young Fan-tailed Cuckoo that had just emerged from the shell. While sitting under the rock to which this nest was attached, a large Water Lizard (*Phrynosoma*) approached, evidently intent on eating a meal, but I managed to disable him with a stick. On previous occasions I had disturbed one of these reptiles feasting on the eggs belonging to two nests of the same pair of birds. What was the Fan-tailed Cuckoo doing, its egg and leaving to be guarded in the nest of the Rock Warbler and the Water Lizards eating so many of their eggs, it is a wonder they are not exterminated in this district. I visited the above nest again on the 20th October, and was surprised to find it torn open and lying in the dirt on the floor. But the young Cuckoo buried in the lining of the nest alive and well. It had been probably pulled down by a dog, for there were the paw-marks of one on the sandy floor of the cave. With the aid of some long thin strips of green bark and skewers formed of twigs, I managed to get it somewhat into its original shape and attached it again to the rock. In the meantime both Rock Warblers were flying or running about the cave, and directly the nest was placed in position, one with a small moth in its bill fed the young Cuckoo and remained in possession of the nest, a yard away from the rock in which I was sitting. Precisely twelve months afterwards to date, on the 20th October, 1901, I found the nest of this pair of birds in a cave about fifty yards away. The female was again sitting on a young Fan-tailed Cuckoo, about two days old, while beneath the nest were two recently broken eggs of the Rock Warbler, containing almost matured young birds.

Another nest, the last visited that season, was built in a cave behind a tree trunk in a gully near Middle Harbour, and contained two fresh eggs of the Rock Warbler and one egg of the Fan-tailed Cuckoo. Of five Rock Warblers' nests examined within a fortnight ending 12th October, 1901, four contained an egg each of the Fan-tailed Cuckoo in addition to two eggs of the rightful owner, and the fifth the young Cuckoo just referred to. As is the general rule, in every instance where an egg of a Cuckoo was deposited, these nests contained one egg less than the usual number laid by the Rock Warbler for a sitting—that is, two instead of

three eggs. On two occasions I have seen new nests containing an egg of the Fan-tailed Cuckoo, that were picked up on the floor of the cave they were built in, apparently broken down by the weight of the Cuckoo while depositing its egg. Generally suspended only by its silky hinge, formed of spider's web, even when the Rock Warbler leaves the nest it oscillates backwards and forwards with a pendulum-like movement.

Mr. Frank Hislop, who took several sets of this species in the neighbourhood of Lithgow, on the Blue Mountains, writes me as follows:—"On the 11th September, 1899, I saw *Origma rubricata* enter into a deserted coal tunnel with some nesting-material in its bill. A week later I visited the place again and entered the tunnel, taking with me the acetylene gas lamp from my bicycle. It was pitch dark, and my lamp did not give any light except directly in front. About fifteen yards from the entrance I found the nest suspended from the side of one of the uprights which the miners had put in to hold up the roof of the mine. The nest was different to the ones you showed me at Roseville and Middle Harbour, the entrance being so large that I could see the single egg it contained lying inside at the bottom of the structure. Subsequently I took three eggs from this nest."

When menaced by danger, these birds are exceedingly solicitous for the welfare of their young. On the 5th October, 1901, at Middle Harbour, I watched a pair running about the flat-topped rocks, and from their actions concluded that they had a nest in the vicinity. Moving quietly about, three fledgelings were at last discovered perched in a row between two rocks. After a long chase, with the aid of a youthful companion, two of them were captured that had sought refuge in crannies of rocks. The cries of one of the young ones, held in my hand while resting against a breast-high rock, attracted the attention of the parents, who, with trailing wings and outspread tail feathers ran rapidly hither and thither over the table-topped surface of the rock, at the same time uttering their shrill notes, and exhibiting every symptom of distress. After comparing it with the parents, who were frequently only two feet away, it was restored to liberty. The other was accidentally killed, and is now a specimen in the Australian Museum Reference Collection.

Except for being slightly duller in colour, and having but little indication of the greyish-white throat, the young are similar in plumage to the adult when they leave the nest.

The nest figured on Plate A. 7, which contained three eggs, I photographed at Roseville on the 11th September, 1900. In form it is a fairly typical one, and measures externally ten inches in length by four inches and a half in breadth. The nesting-material above the structure where it is attached to the rock, is however somewhat shorter and tapers less to a point than usual.

These birds resort to the same nesting-site year after year. If the nest is removed, it is generally built in another cave or rock-shelter not far away, and frequently in a different part of the same cave from which the nest has been taken.

August and the four following months constitute the usual breeding season of this species.

Genus **ORTHONYX**, *Temminck*.**Orthonyx temmincki.**

SPINE-TAIL.

Orthonyx temmincki, Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 294 (1826).

Orthonyx spinicaudus, Temm., Planch. Col., Tom. IV., pls. 428, 429 (1827); Gould, Bds. Austr., fol., Vol. IV., pl. 99 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 607 (1865).

Orthonyx spinicauda, Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 329 (1883).

Orthonyx temmincki, Sharpe, Hand-l. Bds., Vol. IV., p. 2 (1903).

ADULT MALE—*General colour above fulvous-brown, the feathers of the mantle and upper back having white shaft-lines and a broad longitudinal mark of black chiefly confined to their inner webs; lower back, rump, and upper tail-coverts ochraceous-rust colour; upper wing-coverts black, broadly tipped with grey, the lesser coverts entirely grey on their outer webs; quills brown crossed near their base with a greyish-white band, which is succeeded by a broad blackish-brown band, and a narrower one of ashy-fulvous, the latter on the outer webs only; the innermost secondaries blackish, broadly margined on the apical portion of the outer web and tipped with fulvous-brown; tail feathers reddish-brown; crown of the head dark fulvous-brown with a rufescent shade near the margins of the feathers which are edged with black; forehead, lores, sides of the face and cheeks dark ashy-grey; all the under surface white; sides of the neck and breast ashy-grey, the latter washed with fulvous-brown; on the lower throat a crescentic black band, broken in the centre and widening out on the sides of the neck; thighs and under tail-coverts ashy-grey, the tips of some of the longer coverts fulvous-brown; bill black; legs and feet brownish-black; iris brown. Total length in the flesh 8·3 inches, wing 3·7, tail (to ends of central spines) 3·4, bill 0·55, tarsus 1·3*

ADULT FEMALE—*Like the male, but smaller, and having the throat and fore-neck orange-rufous, and the sides of the breast distinctly washed with ochraceous-rust colour. Total length in the flesh 7·7 inches, wing 3·3, tail (to ends of central spines) 3·4, bill 0·55, tarsus 1·2.*

Distribution.—South-eastern Queensland, Eastern New South Wales.

THE coastal brushes of New South Wales are the stronghold of the present species. Numerous examples have been obtained by various collectors in the Tweed, Clarence, Richmond, Macleay, and Bellinger River Districts, its range extending in similar country to near the northern bank of the Hawkesbury River. Like many other coastal brush species, it is not met with at all in the northern portions of the adjoining county of Cumberland, but occurs again where a similar favourable vegetation flourishes at Port Hacking, Bulli, Wollongong, Kiama, and as far south as the Shoalhaven River, where, in the latter neighbourhood, Mr. J. A. Thorpe procured several specimens. The nearest locality to Sydney I have met with this species was at Ourimbah, where a small flock was observed scratching among the fallen leaves near the side of a timber-getter's track, one of which, an adult female, I secured. Of a large series of these birds in the Australian Museum collection, the greater number was procured by Mr. J. A. Thorpe on the Richmond River, and by Mr. Robt. Grant on the Bellinger River.

Stomachs of these birds I examined contained the remains of insects, principally beetles; also fragments of shells of small land molluscs.

Count Salvadori places the genus *Orthonyx* in the family Menuridae.

A nest of this species in the Australian Museum collection is dome-shaped, the base and sides being formed of thick twigs about six inches in length, and the nest proper—which has a lateral entrance—entirely of mosses; the whole structure, with the exception of the opening, being covered and well concealed with dead leaves. It measures exteriorly from back to front of the base fourteen inches and a half, width nine inches and a half, height at the centre of the

nest seven inches, from front of the base to entrance of the nest proper seven inches; the interior, which is rounded in form, averaging four inches in diameter. This nest, which somewhat resembles a miniature Lyre-bird's, was placed between the buttresses of a fig-tree, in a scrub on the Richmond River, and contained two eggs.

The eggs of this species are usually two in number for a sitting, pure white, and vary from an elongate-oval to a compressed ellipse in form, the shell being close-grained, smooth, and slightly lustrous. A set of two, taken at Glennifer, on the Bellinger River, in June, 1892, measures: Length (A) 1.15×0.79 inches; (B) 1.15×0.81 inches. A set taken in the scrubs of the Tweed River in September, 1890, measures: (A) 1.28×0.87 inches; (B) 1.2×0.85 inches. An unusually small-sized set, taken near Ballina, on the Richmond River, in August, 1897, measures: (A) 1.02×0.79 inches; (B) 1.05×0.8 inches.

From Alstonville, near Ballina, Mr. H. R. Elvery writes me:—"The nest of *Orthonyx spinoicauda* is always placed on or near the ground, and generally close to decaying timber. Sometimes it is built on or close to a log, and on two occasions I found it placed on top of a small stone. A favourite nesting-site is in a thick bunch of lawyer-vines, and one I found in this situation, built unusually high, was placed six feet from the ground. This species will frequently return to the old nesting-site, even after being robbed of its eggs. July is the principal month for this bird to breed, but I have taken eggs in every month inclusive from March to September."

Young birds are rich rufous-brown above, with broad blackish margins to the feathers of the head, hind-neck, and upper back, the latter also having golden-buff shaft-lines; lower back, rump, upper tail-coverts, tail, and quills as in the adult; upper wing-coverts blackish, broadly tipped with golden-buff; all the under-surface pale ochreous-rust colour, with blackish margins to the feathers, those on the breast and abdomen being almost white except at the tip; sides of the lower breast like the back, but paler, and having the remains of indistinct blackish cross-bars. Wing 3.25 inches.

In the Tweed River District, this species, which is locally known as the "Scrub-Quail," generally breeds in May, June, and July, and I have one set of eggs that was taken there as late as the 25th September, but they were heavily incubated. From the Upper Clarence River District, Mr. G. Savidge writes me: "*Orthonyx spinoicauda* is an autumn and winter breeder, nesting in April, May, June, and July, nests with eggs being more frequently found in the latter month. This bird frequently betrays the position of its nest by its cries. It is by no means shy; when one discovers its nest generally it runs a short distance away and then stands and watches the intruder." At Glennifer, on the Bellinger River, Mr. Robt. Grant found two nests of this species built between buttresses of trees, each containing fresh eggs, in June, 1892.

Orthonyx spaldingi.

SPALDING'S SPINE-TAIL.

Orthonyx spaldingi, Ramsay, Proc. Zool. Soc., 1868, p. 386; Gould, Bds. Austr., fol., Suppl., pl. 53 (1869); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 331 (1883); North, Rec. Austr. Mus., Vol. I., p. 38, pl. 1, fig. 2 (1890); Sharpe, Hand-l. Bds., Vol. IV., p. 2 (1903).

ADULT MALE—General colour above dark olive-brown, with a blackish wash on the feathers of the upper back; upper wing coverts blackish-brown; quills dull chocolate-brown, their inner webs dark brown; upper tail-coverts like the back, but of a slightly more pronounced shade of olive; tail feathers blackish-brown; head, hind-neck, lores, cheeks, ear-coverts, and sides of the neck black; chin, throat, fore-neck, and centre of the breast white; the sides of the upper breast blackish-brown, of the lower

breast olive-brown; abdomen dull slaty-brown, with narrow indistinct whitish tips to the feathers; thighs and under tail-coverts dull olive-brown; bill black; legs and feet blackish-brown; iris dark brown. Total length 10·5 inches, wing 5·2, tail 4·5, bill 0·7, tarsus 1·9.

ADULT FEMALE—Like the male, but smaller, and having more of a rufescent-olive wash to the upper parts, and the throat and fore-neck orange-rufous instead of white. Total length 9·5 inches, wing 4·5, tail 4, bill 0·65, tarsus 1·75.

Distribution.—North-eastern Queensland.

THIS species was discovered by the late Mr. Edward Spalding, about twenty-five miles inland from Cardwell, and it was named after him by Dr. Ramsay, who described it in the "Proceedings of the Zoological Society," in 1868. Although its range extends northward as far as the Bloomfield River District, it was for many years an extremely rare species in collections. Consequent upon Messrs. E. J. Cairns and Robt. Grant being sent by the Trustees of the Australian Museum on two occasions to the Bellenden Ker Range, the Institution was enriched by numerous examples in all stages of plumage: the Tooth-billed Bower-bird and the present species being the two commonest birds in the collections brought back by them.

Mr. Grant has supplied me with the following notes:—"We usually found *Orthonyx spaldingi* in the ranges around Boar Pocket, Lake Eicham, the Upper Russell and Barron Rivers. Just at daybreak its beautiful, clear, chirping call-notes may be heard. If one proceeds cautiously towards the singing bird, a small company of five or six individuals may be found scratching among the fallen leaves, or the decaying wood of a fallen tree. It is extremely shy, and usually on being disturbed instantly runs around the trunk or disappears in the surrounding dense undergrowth; but occasionally one will run along the top of a log, evidently with the purpose of watching the intruder. Their loosely constructed and partially dome-shaped nests are built of thin sticks, twigs, dead leaves, and mosses, and are usually placed in a mass of lawyer-vines, or in a stag-horn or bird-nest fern growing on a tree, at a height of six to eight feet from the ground. One, found built in a bird-nest fern, and in which the female was sitting, Mr. Cairn reached by standing on my shoulders. This nest contained two eggs, but in all the others we found only one egg for a sitting."

From further north, in the Bloomfield River District, Mr. Frank Hislop writes me:—"Spalding's Spine-tail is only found in the scrub on the mountains, and generally in small flocks from four to six in number. They live on insects, worms, and berries. Their nests, which are dome-shaped, are outwardly made of small sticks, and lined inside with moss, and are placed on a log or in a bunch of lawyer-vines; I have also found them among the leaves in the side of a lawyer-palm. Generally they are not higher than two feet from the ground, and only one egg is laid for a sitting."

The eggs are pure white, and vary in shape from swollen-oval, somewhat sharply pointed at the smaller end, to elongate-oval, the shell being close-grained, smooth, and slightly lustrous. Two average specimens measure:—Length (A) 1·45 × 1 inches; (B) 1·38 × 1·1 inches. An abnormally elongated specimen, in the collection of Mr. Charles French, Junr., taken in the Bloomfield River District, on the 8th March, 1899, measures:—1·6 × 1·02 inches.

Young birds have the general colour above brownish-black, the feathers of the upper back being conspicuously centred with light ochraceous-brown; rump and upper tail-coverts dull chocolate-brown; upper wing-coverts blackish-brown, broadly tipped with light chocolate-brown; quills blackish-brown, the apical half of the outer webs of the primaries margined with dull brown, becoming richer in colour on the secondaries, the innermost series of which are broadly margined on both webs with chocolate-brown; tail-feathers blackish-brown; head and hind-neck blackish-brown; a line of feathers from the nostril over the eye chocolate-brown, as are also the tips of the feathers on the sides of the hind-neck; chin, throat, fore-neck, and

breast blackish-brown, conspicuously mottled with pale brown, the feathers on the abdomen broadly tipped with brownish-white, and those on the sides of the body with chocolate-brown; under tail-coverts blackish. Wing 4.4 inches.

Nearly adult birds of both sexes have the feathers of the breast and abdomen stained with rusty-brown; and a young male now before me has a few pure white feathers intermingled with the black ones on the sides of the head and the hind-neck.

From the date of taking the egg in the collection of Mr. French, Junr., it is apparent that this species, like its southern ally *Orthonyx temminckii*, is an autumn and winter breeder. Messrs. Cairn and Grant procured several recently-fledged birds early in June, also fresh eggs during the same month, and as late as the middle of August.

Genus DRYMAEDEDUS, Gould.

Drymaedus brunneipygius.

SCRUB-ROBIN.

Drymaedus brunneopygia, Gould, Proc. Zool. Soc., 1840, p. 179; *id.*, Bds. Austr., fol., Vol. III, pl. 10 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 290 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII, p. 343 (1883).

Drymaedus brunneipygius, Sharpe, Hand-l. Bds., Vol. IV., p. 4 (1903).

ADULT MALE—General colour above brown, the feathers of the back indistinctly margined with ashy-brown at the tips; the rump slightly tinged with rufous-brown, lesser wing-coverts like the back; the median and greater coverts dark brown, externally margined with brown and tipped with ashy-white; quills dark brown, all except the outermost primaries and innermost secondaries crossed near the base of the inner web with a narrow white bar; outer webs of the primaries near the middle externally edged with ashy-white, those of the secondaries margined with fulvous-brown; upper tail-coverts rufous-brown; tail feathers brown, externally margined with rufous-brown, and having the lateral feathers tipped with white; lores and a ring of feathers around the eye dull brownish-white, the latter broken on the upper and anterior portions by a small blackish spot; ear-coverts brown, blackish at the base; all the under surface ashy-brown, paler on the throat, browner on the chest and sides of the body; centre of the abdomen and vent whitish; under tail-coverts tawny-brown; bill dark brown; legs and feet dark brown. Total length 8.2 inches, wing 4.7, tail 4.2, bill 0.6, tarsus 1.45.

ADULT FEMALE—Similar in plumage to the male, but smaller.

Distribution—New South Wales, Victoria, South Australia, Western Australia.

THE range of this ground-frequenting species extends throughout the dry scrubby portion of South-western New South Wales into North-western Victoria, and the Murray scrub in the adjoining portion of South Australia, where Gould procured the type, its range extending into Western Australia. Specimens in the Australian Museum, procured by Mr. George Masters at Mongup, Salt River, Western Australia, in January and February, 1869, are indistinguishable from examples obtained in South-western New South Wales and the Murray scrub in South Australia. One example in the Macleay Museum, from King George's Sound, is darker than average examples from Eastern Australia.

Gould's vernacular name of "Scrub-Robin" for the different species of this genus is not an appropriate one, for it tends to give an impression that they belong to the Muscipidae. "Northern Scrub-Robin," too, would more fittingly distinguish *Drymaedus superciliaris* than that of "Eastern Scrub-Robin," for it is found only in the extreme northern portion of the Cape York Peninsula.

Through Mr. C. French, Junr., I have received the following notes from Mr. C. McLennan relative to this species:—" *Drymaedus brunneipygius* is not uncommon on Pine Plains Station, in the Wimmera District, North-western Victoria. It is usually met with in pairs in the thick mallee, although the male is more shy than the female. Often when setting dingo traps I have had one of the latter sex come within a yard or two of me to see what I was doing, at the same time uttering a sharp shrill note. In habits these birds resemble the Chestnut-backed Ground-Thrush, being usually seen on the ground. They emit a shrill whistling note, and frequently keep moving the tail up and down. In 1902 I found three nests of this species, each containing a single egg, which is the usual number for a sitting. One, with a fresh egg, on the 10th September; another on the 6th October, with a fresh egg; and the third on the 10th December, with an egg slightly incubated. One was built on the ground, another on the knob of a mallee bush a foot from the ground. They make a foundation, about eight or nine inches in diameter, of thin sticks, and build a nice round nest composed of grass and bark in the centre. I am sorry that I cannot send you the nests just as they are built, for the sticks are all laid very neatly around and nearly level with the rim, but on attempting to remove the sticks they all fall apart. I am sending you two nests, each with the collection of sticks surrounding them. One is the most perfect I have ever seen."

The latter nest is an open cup-shaped structure, formed externally of very thin strips of dead blackish-grey bark, and is lined inside with pale brownish-white wiry rootlets. Externally it measures four inches in diameter by two inches and a half in depth, the inner cup measuring two inches and three-quarters in diameter by one inch and a half in depth. It is tolerably compactly formed, and bears a general resemblance to the inner lining of some nests of *Collyriocincla harmonica* or *Oreocica cristata*, but the walls are thicker and the inner cup slightly smaller. The sticks forming the foundation, some of which are slightly curved, others nearly straight, average seven inches in length, and from an eighth to a quarter of an inch in thickness, and there are about one hundred and fifty of them. The other nest is much smaller and more saucer-shaped, the lining consisting entirely of fine yellowish-white dried grasses, and the sticks surrounding it are shorter and fewer in number.

The eggs taken by Mr. McLennan from the above-described nests are oval in form, one is somewhat sharply pointed at the smaller end, and the shell is smooth and slightly lustrous. They are of a very faint greenish-grey ground colour, which is freckled, spotted, and blotched with different shades of brown; on one specimen the markings are uniformly distributed over the shell, on the other they predominate on the larger end where they are confluent and form a broad and well defined zone. Length (A) 1.03×0.73 inches; (B) 1.07×0.71 inches. These eggs in colour and markings resemble some varieties of the eggs of *Artamus superciliosus* or *A. personatus*. An egg in the collection of Mr. Charles French, Junr., taken by Mr. J. C. Goudie about fifteen miles from Birchip, in the Western District of Victoria, is oval in form the shell being close-grained, smooth, and lustrous. It is of a pale bluish-grey ground colour which is freckled, spotted, and blotched with dull brown, yellowish-brown, wood-brown, and slaty-grey, the markings predominating on the thicker end and forming confluent patches. Length 0.99×0.76 inches. Another egg, taken by Mr. Goudie on the 28th January, 1899, measures 1×0.75 inches. These eggs are larger, but otherwise resemble, like those of *Drymaedus supercilialis*, a not uncommon variety of the egg of the introduced House-Sparrow (*Passer domesticus*).

The late Mr. K. H. Bennett, when living at Mossgiel, in Western New South Wales, wrote as follows:—" *Drymaedus brunneipygius* is very rare here, and during my long residence in this part of the Colony I have only met with it three times, and on one of these occasions I was fortunate enough to discover its nest. It was placed on the ground at the foot of a small tree in thick mallee scrub, and contained a nearly fledged young bird, which assimilated very closely to the surrounding dead leaves, etc., amongst which the nest was built. I certainly

should never have noticed it but for the actions of the old birds, who kept hopping around me, uttering a shrill whistling note, and moving their tails up and down all the time: indeed it is doubtful if I should have discovered the nest even then, although not more than a yard from my feet, if the young one had not moved."

Drymaëdus superciliaris.

NORTHERN SCRUB-ROBIN.

Drymaëdus superciliaris, Gould, Proc. Zool. Soc., 1850, p. 200; *id.*, Handbk. Bds. Austr., Vol. I, p. 291 (1865); *id.*, Bds. Austr., fol., Suppl., pl. 16 (1869).

Drymaëdus superciliaris, Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 314 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 4 (1903).

ADULT MALE—*General colour above rufous-brown, the plumes of the lower back and rump, long, downy, and richer in colour; lesser wing-coverts slightly browner than the back; median and greater coverts black tipped with white; quills blackish-brown, darker in the centre, all except the outermost primaries and the innermost secondaries crossed near the base of the inner web with a white bar; the primaries externally margined with white, and the secondaries margined and tipped with white, the innermost secondaries washed with rufous-brown on their outer webs; upper tail-coverts chestnut red; central tail feathers dull chestnut-red, the remainder blackish-brown margined with dull chestnut-red for two-thirds of their length and tipped with white; lores and feathers behind the upper portion of the eye white; a small spot above and an oblique streak below the eye black; ear-coverts pale sandy-brown; chin, cheeks, and throat white; remainder of the under surface white, washed with sandy-brown, which is darker on the sides of the body; lower flanks light sandy-brown; under tail coverts white washed with sandy-brown. Total length 8·2 inches, wing 4·1, tail 1, bill 0·6, tarsus 1·65.*

ADULT FEMALE—*Similar in plumage to the male, but smaller.*

Distribution—Cape York Peninsula.

NO specimen of the present species has been recorded from any other part of the Australian continent than the neighbourhood of Cape York, where it was discovered by MacGillivray in 1848, also its nest and eggs. Mr. J. A. Thorpe obtained specimens at Cape York in 1867-8, and Mr. George Masters procured an adult male in the same locality in 1875, during the stay there of the "Chevert" Expedition, under the command of the late Sir William Macleay.

From Somerset, Mr. Bertie L. Jardine writes me:—"Drymaëdus superciliaris is a very common species here, and may be seen hopping about the scrub or making a short flight close to the ground. Frequently, as it perches on a log or dead branch near the ground, it will utter a loud shrill whistle, at the same time moving its tail up and down after the manner of a Rail. In habits and actions it resembles very much the Pitta, passing most of its time on the ground, and feeding upon insects and their larvæ, and a small species of *Helix* found among the fallen leaves. Although by no means a shy bird, when startled it will hop away with great speed and quickly disappear among the vines and undergrowth. The nest, which is generally placed at the foot of a small tree, consists of a circular hole scooped in the ground, about four inches in diameter and one inch and a half in depth, and this is roughly lined with the long wiry tendrils of a scrub plant. Around this cupped portion of the structure is built a compact wall, about an inch or more in height, of sticks and leaves. As the nesting season, which begins in November and continues until the end of January, is during our heavy rains, this wall is, I think, in all probability raised with the motive of preventing the water from running into the nest. The structure measures externally over all about nine inches, and two eggs are usually laid for a sitting."

Two eggs in Mr. Keartland's collection, that were taken by Mr. Jardine, are short ovals in form, the shell being close-grained, dull, and lustreless. They are of a dull white or very light stone-grey ground colour, which is freckled and spotted with different shades of brown, intermingled with similar underlying freckles and spots of faint bluish-grey; the markings are of irregular shape and are almost uniformly distributed over the shell, but they are more thickly disposed on one specimen than the other. They measure alike 0.87×0.7 inches, and resemble in colour and markings a variety of the egg of the common introduced House Sparrow (*Passer domesticus*).

Genus CINCLOSOMA, Vigors & Horsfield.

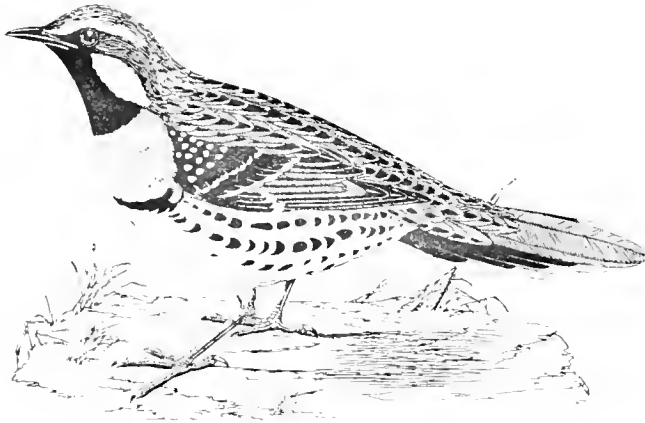
Cinclosoma punctatum.

SPOTTED GROUND-THRUSH.

Turdus punctatus, Lath., Ind. Orn., Suppl., p. xlv., (1801).

Cinclosoma punctatum, Gould, Bds. Austr., fol. Vol. IV., pl. 1 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 433 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 332 (1883); Hand-l. Bds., Vol. IV., p. 2 (1903).

ADULT MALE—General colour above brown, with blackish centres to the feathers, narrower and less distinct on the crown of the head, hind-neck, rump, and upper tail-coverts, the latter with a



SPOTTED GROUND-THRUSH.

greyish wash towards the tips; upper wing-coverts glossy black with a spot of white at the tip; primaries brown, margined externally with ashy-grey at the base, white in the centre; the outermost secondaries dark brown, broadly margined externally with brown, the innermost series chestnut, brownish at the tips, with a broad longitudinal stripe of black on the outer web; two central tail feathers brown, slightly washed with grey except near the shaft, and having narrow whitish edges and a small indistinct blackish spot at the tip; the remainder black largely tipped

with white; forehead grey; cheeks, lores, feathers around and extending in a narrow line behind the eye black, bordered above with a broad white superciliary stripe; ear-coverts brown, greyish at the base; a large oval spot on the side of the neck pure white, margined with a narrow black line which joins the glossy blue-black feathers of the chin and throat; fore-neck grey, the lower feathers next the breast largely tipped with black; breast and abdomen white, with a very faint creamy-buff tinge; sides of the body rich fulvous-brown, whitish at the tips, with a large tear-shaped spot of black in the centre of each feather; under tail-coverts creamy-buff mesially streaked with black, some of the longer feathers whitish at the tip; bill black; legs and feet pale flesh colour; iris dark grey. Total length in the flesh 10.75 inches, wing 4.3, tail 4.5, bill 0.7, tarsus 1.2.

ADULT FEMALE—Distinguished from the male by being slightly duller in colour and less distinctly marked on the upper parts; the upper wing-coverts are grey with black centres and white tips; the superciliary stripe is pale creamy-buff; lores and feathers around the eye whitish; chin and throat very pale creamy-buff; the large spot on the side of the neck orange-buff instead of white; no

black band separating the grey feathers of the fore-neck from those of the breast, and the feathers on the centre of the body more distinctly washed with creamy-buff.

Distribution.—Southern Queensland, New South Wales, Victoria, South Australia, and Tasmania.

THE present species is generally distributed in favourable situations over the greater portion of South-eastern Australia and Tasmania. On the continent it evinces a decided preference for fern and scrub-covered wastes, and lightly timbered country near the coast. Inland its favourite haunts are the stony and drier portions of mountain ranges. In Victoria it used to be common in the scrub near the beach at Cheltenham, Mordialloc, and Frankston, also in the adjacent hills and open forest country extending across to Western Port Bay. It is fairly numerous in the coastal districts of New South Wales, and I have noted it on the Blue mountains, and stony scrub-covered ranges near the head of navigation of the Clarence River. At Roseville, Middle Harbour, and in the National Park, I have frequently flushed it from low ferns and grass-trees, but always where sheltered above by trees of larger growth. When disturbed it does not fly far, even after being shot at, but suddenly drops into cover, and then runs very rapidly over the ground and fallen logs. So one sees it generally some distance away from the spot that it was first observed or flushed from. I have also seen it take refuge in high trees. As Gould has remarked, it rises with a loud burring noise, like a Quail; and, as he observed in Hobart, so it is at the present time in Sydney, often seen exposed for sale in poulterers' shops.

The wing-measurement of adult males varies from 4·3 to 4·5 inches. In the "Catalogue of Birds in the British Museum," Dr. Sharpe has correctly pointed out in his key the distinguishing characters of the sexes of this species, but in the following pages both of his descriptions are those of females.

Mr. A. Zietz has kindly sent me for examination a semi-adult male, procured at Lobenthal, South Australia, also two young birds obtained about eight miles south of Adelaide. Dr. Morgan informs me that this species is fairly common in the neighbourhood of the latter city, but is nowhere plentiful.

Stomachs of these birds I have examined contained the remains of various insects and their larvæ.

The nest is a round, open, and loosely-built structure, composed of strips of bark, leaves, and grasses, and so loosely placed together that it will seldom bear removal. An average nest measures externally five inches in diameter, and the inner cup three inches and a half in diameter by one inch and a half in depth. It is always built on the ground, sometimes in a slight depression, and generally close to a fallen log, stone, the base of a sapling or tree, or sheltered by a bush, or hidden by low ferns. At Colo Vale, New South Wales, where these birds are common, Mr. N. Etheridge found a nest in a hollow at the bottom of a burnt out stump. While collecting in company with the late Mr. W. Kershaw, at Cheltenham, Victoria, he informed me that he had on several occasions found in that locality eggs of this species, dropped by the birds on the bare ground under low spreading bushes.

The eggs are usually two, sometimes three in number for a sitting, oval, elongate-oval, or elliptical in form, the shell being close-grained, smooth, and slightly lustrous. They are of a dull white, and in rare instances of a faint creamy-white ground colour, which is freely freckled, spotted, and blotched with wood-brown, umber-brown, and similar underlying marks of faint bluish-grey. Generally the smaller markings are uniformly distributed over the shell, while the larger ones are irregularly scattered or predominate at the thicker end. Sometimes the underlying spots or blotches are larger and more numerous than the markings on the outer

surface. In a set before me the specimens are broadly blotched all over, in another they are very small and confined almost to the larger end. A set of two, taken at Copmanhurst, New South Wales, measures: -Length (A) 1.28×0.95 inches; (B) 1.3×0.96 inches. A set of two, taken at Cheltenham, Victoria, measures: Length (A) 1.23×0.87 inches; (B) 1.25×0.85 inches.

Young birds have the general colour above dull ashy-brown, the apical portion of the feathers of the back and rump dull rufous, and having distinct blackish margins; upper tail-coverts ashy-brown with blackish centres; under surface pale buff, whitish on the centre of the breast, all the feathers having more or less distinct blackish tips or margins, especially those on the fore-neck; under tail-coverts pale buff with a longitudinal streak of black down the centre. Wing $\frac{1}{2}$ inches.

The first indication of the sex of the young male is seen in some specimens in the blackish wash on the lores, and some of the dull whitish feathers on the throat are mottled with blue-black, and the black markings on the upper parts and on the sides of the body are darker and more distinct than in the adult female. In others the lesser upper wing-coverts are black, and there is a broken band formed by subterminal black spots on the lower dark grey feathers on the fore-neck.

The breeding season of this species commences in August, and continues until the middle of February, but nests with eggs are usually found from September to December. In Victoria I have found their nests generally in October; but in New South Wales I have seen eggs that were taken at the end of August, and young birds fully fledged in September. At Stony Pinch, Copmanhurst, Mr. Savidge pointed out a nest to me that he had taken eggs from on the 10th October; while at Lithgow, Mr. Robt. Grant found a nest about the same date containing a newly hatched young one and a chipped egg. There are undoubtedly two, if not three broods reared in the season, for I have seen two fresh eggs that were taken near Bathurst on the 27th January, 1893; and, in company with Mr. Frank Hislop, a fledging was captured in the low undergrowth at Roseville in March, 1902. I kept it for a day and a night, during which time it uttered a note like a young chicken, and then took it to the same place and restored it to liberty.

Cinclosoma castanonotum.

CHESTNUT-BACKED GROUND-THRUSH.

Cinclosoma castanonotus, Gould, Proc. Zool. Soc., 1840, p. 113; *id.*, Bds. Austr., fol., Vol. IV., pl. 5 (1848).

Cinclosoma castanonotum, Gould, Handbk. Bds. Austr., Vol. I., p. 435 (1865).

Cinclosoma castanonotum, Sharpe, Cat. Bds. Brit. Mus., Vol. VII, p. 333 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 2 (1903).

ADULT MALE—*General colour above rich brown; scapulars, lower back, and rump, dark reddish-chestnut; upper tail-coverts brown; upper wing-coverts black, tipped with white; quills dark brown, margined externally with lighter brown, the outer webs of some of the primaries edged with dull white in the centre, the apical portion of the outer web of the outermost feather white; central tail feathers brown, the remainder blackish brown gradually passing into black on the outermost feather, and all largely tipped with white; lores and feathers below the eye black; a stripe over the eye extending on to the sides of the nape, and a broader one reaching from the base of the lower mandible to the sides of the neck white; ear-coverts brown; chin, centre of the throat, and fore-neck, glossy black; breast and abdomen pure white, the outer webs of the feathers at the sides black; sides of fore-neck and*

breast dull ashy-grey, flanks brown; under tail-coverts white, brown on the outer web except at the tip, and having a longitudinal streak of black next the shaft. Total length 9·3 inches, wing 4·1, tail 4·1, bill 0·7, tarsus 1·2.

ADULT FEMALE—Duller in plumage than the male, the feathers of the lower back and rump brown, indistinctly margined with chestnut; upper wing-coverts brown tipped with white; lores and feathers below the eye ashy brown; chin and centre of the throat dull ashy-grey, with whitish mottlings to most of the feathers; fore-neck dull ashy-grey. Total length 9 inches, wing 3·8, tail 3·8, bill 0·65, tarsus 1·2.

Distribution.—Western New South Wales, Western Victoria, South Australia, Western Australia, North-western Australia.

THE Chestnut-backed Ground Thrush is widely distributed over the southern half of the Australian continent. Gould procured the types in the belts of the Murray River in South Australia, and I have examined specimens and eggs that were obtained in the Wimmera District, in North-western Victoria. There is a skin of a semi-adult male in the Australian Museum, procured by the late Mr. K. H. Bennett at Mossgiel, Western New South Wales, who remarked in his MS. notes: "This species is frequently met with in the timbered country to the north of Mossgiel, but is never found on the plains, or the clumps of timber, or the sandhills scattered over them." Mr. G. A. Kearland secured specimens while a member of the Calvert Exploring Expedition, in Western Australia, about forty miles south of Separation Well, but they were abandoned later on, with the remainder of the first collection, at Johanna Springs. Mr. George Masters obtained a series of adults and young at Mongup, Salt River, in January, 1869; and in the same State an adult male was obtained in the Victoria Desert, by the Elder Exploring Expedition.

Regarding this species, Mr. Kearland writes me: "The Chestnut-backed Ground Thrush is a rather shy bird, and although it passes much of its time on the ground, and generally seeks shelter under a bush, it will also fly on to the branch of a neighbouring tree. In North-western Australia several were observed feeding on the ground in open forest country. When one was shot, the remainder flew into the trees close by."

From the South Australian Museum, Mr. A. Zietz, the Assistant-Director, writes me:—"*Cinclosoma castanonotum* does not seem to occur in the neighbourhood of Adelaide. I have seen one specimen from Parallana, in the Flinders Range, procured by Mr. R. M. Hawker; and you will find amongst our Museum specimens which I send you for examination, a nearly adult male from Leigh Creek, which is three hundred and seventy-four miles north of Adelaide. This is about the same latitude as Callabonna Creek, where I have also seen the bird myself. I do not remember that we ever had a fresh shot specimen at the Museum."

Dr. A. M. Morgan informs me that he met with these birds at Mount Gunson, about one hundred miles to the north-west of Port Augusta, in August, 1900. They were very shy, and closely resembled in habits *Cinclosoma punctatum*. Their note is a feeble chirrup. He did not find any of their nests. Again, in company with Dr. A. Chenery, in August, 1902, during a trip made from Port Augusta to the Gawler Ranges, this species was met with, and Dr. Morgan sends me the following note: "*Cinclosoma castanonotum* does not seem to be numerous, but is a shy bird and may have been overlooked. They were in mulga scrub at Wippipipee, and in mallee at Donal's Plain. They run well, do not hop; we only saw one fly which had been shot at and missed; it then only flew a short distance."

Mr. W. D. Campbell, of the Geological Survey, found a nest and two eggs of this species at Menzies, Western Australia, which he forwarded with the nesting-material to the Trustees of the Australian Museum, with the following note: "This nest I found early in August, 1898, being merely a hollow in the red-chocolate soil from diorite rocks, and loosely lined with the

material I am sending you. It was sheltered above by a dead bush, and averaged about three inches in internal diameter." The nesting-material consists of a quantity of short twigs, strips of bark, and long narrow dead leaves.

The eggs are oval or elongate-oval in form, the shell being close-grained, smooth, and lustrous. They are dull white or greyish-white in ground colour, and have, as a rule, uniformly distributed over the shell, numerous freckles and small irregular-shaped spots, varying from pale brown to dark wood-brown, and intermingled with a few similar underlying markings of pale bluish or inky-grey. In some they are more thickly disposed on the larger end, where they coalesce and form small confluent patches, caps, or an irregular-formed zone. A rare variety has the surface markings nearly black, and the underlying ones which are more numerous, light grey. A set of two measures as follows:—Length (A) 1.23×0.84 inches; (B) 1.22×0.84 inches. A set of two, taken in the Wimmera District, North-western Victoria, measures:—Length (A) 1.23×0.83 inches; (B) 1.2×0.82 inches.

Young birds resemble the adult female, but are paler, and have the feathers of the chin and throat dull white, and those of the fore-neck pale ashy-grey, the former indistinctly tipped and the latter parts margined with dusky-brown. Young males have the lower feathers of the back and rump distinctly margined with chestnut; those of the centre of the throat and fore-neck dull ashy-grey, like the adult female, but the former are mottled with black. Nearly adult males may be distinguished by having a few of the feathers on the throat and centre of the fore-neck dull ashy-grey instead of glossy-black.

Cinclosoma cinnamomeum.

CINNAMON-COLOURED GROUND-THRUSH.

Cinclosoma cinnamomeum, Gould, Proc. Zool. Soc., 1846, p. 68; *id.*, Bds. Austr., fol., IV., pl. 6 (1848).

Cinclosoma cinnamomeum, Gould, Handbk. Bds. Austr., Vol. I., p. 437 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 334 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 2 (1903).

ADULT MALE—*General colour above cinnamon-rufous, the head and hind-neck distinctly washed with brown; upper wing-coverts black, largely tipped with white; quills dark brown, externally margined with pale cinnamon, these margins becoming broader and darker on the secondaries which have the innermost series entirely cinnamon-rufous, as are also the inner greater-coverts; two central tail feathers cinnamon-rufous, the next on either side black, the remainder black largely tipped with white; superciliary stripe pale buff; lores, feathers below the eye and continuing in a narrow line down the sides of the neck black; ear-coverts cinnamon-brown; chin and centre of the throat glossy black; cheeks and sides of the throat white; fore-neck cinnamon, whitish in the centre, and followed by a broad glossy black patch across the upper breast; centre of the breast and the abdomen white; sides of the body cinnamon, separated from the former by a line of black streaks on the feathers; under tail-coverts white, the outer webs of some brown and having a longitudinal black streak close to the shaft; bill dark brown; legs and feet olive. Total length 8 inches, wing 3.5, tail 3.2, bill 0.63, tarsus 1.*

ADULT FEMALE—"Differs from the opposite sex in the absence of the black markings of the throat, breast, and wings, these parts being brownish-grey." (Gould).*

Distribution.—Western New South Wales, Central Australia, Western Australia.

* Handbk. Bds. Austr., Vol. i., p. 437 (1865).

THIS species was discovered by Captain Charles Sturt in North-western New South Wales, in 1845, who writes as follows in his "Narrative of an Expedition into Central Australia":—"This third species of *Cinclosoma* appeared at the Depot in Lat. $29\frac{1}{2}^{\circ}$ Long. 142° during the winter months in considerable numbers, and a good many specimens were procured."

Three examples of the Cinnamon-coloured Ground-Thrush were obtained by the members of the Horn Scientific Expedition in Central Australia in 1894, and were subsequently received by me when the collection was sent for examination. From the South Australian Museum I have also received on loan an adult and an immature male procured at Mount Burrell, to the north of the Macdonnell Ranges in Central Australia.

Mr. G. A. Kearland has kindly favoured me with the following notes:—" *Cinclosoma cinnamomeum* is a lover of the most arid stony country, where their colour harmonises so closely with their surroundings that they are not easily seen. During the early morning they roam about the open land in search of food, but as the sun grows hot they seek the shelter of low dense bushes, beneath whose shade they pass the day. If disturbed they immediately fly to another bush, but I have never seen them perch. During the journey of the Calvert Exploring Expedition in Western Australia, I took my first clutch of these eggs under rather peculiar circumstances. I was staying behind collecting, when Mr. C. F. Wells called out that he had discovered a nest of this Ground-Thrush, containing two eggs. He offered to mind my camel whilst I waited for the return of the bird. My camel became restive, and Mr. Wells called me to 'come on.' I secured the eggs; but the nest, which was simply a few acacia leaves placed in a slight depression under a low bush, fell to pieces on being lifted. I wrapped one egg in my handkerchief, and had placed it in the quart-pot on my saddle, when 'Warrior' (the camel) tried to get away. I mounted with the egg in one hand, my gun in the other, and the reins in my teeth. The camel bolted after the caravan, which was about a mile away, on the opposite side of a boggy clay-pan. Instead of following the track, he tried a short cut, with the result that he floundered through the mud and nearly lost his rider, but on nearing the team he became steady, and the eggs were safely packed. Several other clutches were afterwards found in similar situations. This Ground-Thrush is met with in the driest parts of Central and Western Australia."

In forwarding the eggs of this species taken at Erldunda, Central Australia, Mr. C. E. Cowle wrote as follows:—"The nest, an open cup-shaped one, was built at the foot of a low *Eremophila* bush, and was formed of a few twigs and dead leaves, and fell to pieces when I attempted to remove it. Another nest, containing young ones, was found at the base of a bush, and close to a dry lake."

The eggs are oval or elongate-oval in form, the shell being close-grained, smooth, and more or less glossy. In ground colour they vary from dull greyish-white and whitish-brown to brownish-grey, over which is distributed, in typical specimens, large blotches and longitudinal streaks of umber-brown, wood-brown, and a few similar underlying markings of dull bluish-grey. Others have the ground colour almost obscured by freckles, irregular-shaped spots and mottlings of different shades of brown, intermingled with a few small ink-like stains appearing as if beneath the surface of the shell. The markings on this type resemble those seen in a variety of the egg of *Turnix selys*. A set of two, taken by Mr. C. E. Cowle, near Illamurta, Central Australia, in April, 1898, measures as follows:—Length (A) 1.1×0.81 inches; (B) 1.1×0.8 inches. Another set of two, taken by the same gentleman at Erldunda, in March, 1900, varies somewhat in shape and size, the markings too on one specimen are very much darker than on the other:—Length (A) 1.14×0.76 inches; (B) 1.09×0.8 inches.

The immature male has the head and hind-neck brown, the lesser and median wing-coverts black with pale buffy-white tips, the greater coverts cinnamon-rufous, the tips of the outermost series white washed with cinnamon-rufous; lores whitish with narrow dusky tips; the glossy black patch on the centre of the throat is smaller and mottled with white; fore-neck pale brown with only a wash of cinnamon in the centre; the black band on the upper breast is smaller and duller in colour, and the sides of the breast destitute of the line of black streaks on the feathers.



STURT'S DEPÔT GLEN.

"Depôt Glen," where Sturt's party stayed for nearly five months, and observed so many of the birds referred to in his work, is the only place where there is permanent water in an otherwise arid region. It is situated on Evelyn Creek, about eight miles to the left of the main road midway between Milparinka and Tibboburra, in North-western New South Wales, and about eight hundred and sixty miles north-west of Sydney. For an opportunity of being able to give a representation of this interesting spot I am indebted to the Rev. J. Milne Curran, F.G.S., who took several photographs during a visit there.

Sturt's Expedition, which left Adelaide in 1844,

traversed Western New South Wales, entered South Australia again, and journeyed for a short distance in a northerly direction in Western Queensland. The intrepid explorer then retraced his steps to Depôt Glen, without ever penetrating to the centre of the continent—the goal he had set out to attain. This was, however, accomplished later on by a member of the same expedition, Mr. John McDouall Stuart, who, on the 22nd April, 1860, was the first explorer to reach the centre of the continent, and in a subsequent expedition to cross it. Among the historic relics in the Australian Museum are three pieces of planks, remains of the boat left

by Captain Sturt at Evelyn Creek, Depôt Glen, in 1845. They were obtained by Mr. T. Boulton, of the Department of Mines, Sydney, from Mr. Lang, at Mount Poole Station, in 1894.

Cinclosoma castanothorax.

CHESTNUT-BREASTED GROUND-THRUSH.

Cinclosoma castaneothorax, Gould, Proc. Zool. Soc., 1848, p. 139; *id.*, Handbk. Bds. Austr., Vol. I., p. 438 (1865); *id.*, Bds. Austr., fol., Suppl., pl. 32 (1869).

Cinclosoma castanothorax, Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 335 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 2 (1903).

ADULT MALE—"Crown of the head, ear-coverts, back of the neck, and upper tail-coverts brown; stripe over the eye and another from the base of the lower mandible down the side of the neck white; shoulders and wing-coverts black, each feather with a spot of white at the tip; remainder of the upper surface, the outer margins of the scapulars, and a broad longitudinal stripe on their inner webs next the shaft, deep rust-red; primaries, secondaries, and the central portion of the scapulars dark brown; tail black, all but the two central feathers largely tipped with white; chin and throat black; chest crossed by a band of rich rust red; sides of the chest and flanks brownish grey, the latter blotched with black; centre of the abdomen white; under tail-coverts brown deepening into black near the tip, and margined with white; bill black; feet black. Total length $8\frac{1}{2}$ inches, wing 4, tail $4\frac{1}{4}$, tarsi 1." (Gould).*

ADULT FEMALE—"General colour above chestnut-brown, becoming slightly lighter on the rump; head and neck amber-brown; scapulars chestnut-brown; inner series of the lesser wing-coverts chestnut-brown; the remainder, also the median and greater wing-coverts blackish-brown with white tips, more or less washed with ochraceous-buff, the margins of the outer webs of the inner greater coverts light brown; primary coverts blackish-brown tipped with white; quills dark brown, the median portion of the outer web of the third, fourth, fifth, and sixth primary dull white; the outer webs of the secondaries with rufous-brown margins, the innermost series with a broad rufous-brown stripe on the inner web next the shaft; upper tail-coverts dusky brown with paler brown margins; two central tail feathers blackish-brown, the remainder black largely tipped with white; a stripe extending from the nostril over the eye and on to the sides of the nape, and another from the base of the lower mandible to below the ear-coverts white with a slight ochraceous-buff wash which is more distinct on the posterior half; lores and feathers below the eye blackish; ear-coverts amber-brown with indistinct blackish margins and buffy-white bases; chin white; upper throat grey, whitish in the centre; fore-neck grey, forming a broad band which extends on to the sides of the chest; centre of the breast white washed with creamy-buff; sides of the breast grey with an ochraceous wash; abdomen white, lower sides of the body ochraceous-buff; under tail coverts white on inner webs and tips, brown on the outer with a narrow blackish streak next the shaft, some of the shorter under tail-coverts washed with creamy-buff; bill black. Total length 9 inches, wing 3.8, tail 4.1, bill 0.7, tarsus 1.65.

Distribution.—Southern Queensland, Central Australia.

THE present species is undoubtedly the rarest passerine bird in Australia. Since Gould described the type, an adult male, in 1848, up to the present no other specimen has been recorded, although an apparently closely allied representative—*Cinclosoma marginatum*—has been described by Dr. Sharpe, also from a single specimen, obtained in North-western Australia. The type of *Cinclosoma castanothorax* was procured by the late Mr. Charles Coxen "in the scrubby belts of trees growing on the table-land to the northward of the Darling Downs, Queensland." In the original description, Gould states the stripe over the eye is white; this is

* Proc. Zool. Soc., 1848, p. 139.

undoubtedly a *lapsus calami*, which he copied in his "Handbook," and "Supplement to the Birds of Australia,"* although he figures it in the latter work with an ochraceous-buff eyebrow, and states in other places in both works that it has a buffy stripe over the eye.

The female described on the preceding page was procured by Mr. G. A. Kearland at Deering Creek, Central Australia, during the journey of the Horn Scientific Expedition. This specimen has the superciliary stripe, also the one on the side of the throat, almost pure white, with only a faint wash of ochraceous-buff on the posterior portions, which led me formerly to believe it was an abnormally plumaged young male of *Cinclosoma castanonotum*. The acquisition and examination of a larger series of the latter species, has proved me wrong in so doing.

Relative to this specimen, Mr. Kearland writes me:—"The different species of the genus *Cinclosoma* are usually shy, and when once disturbed difficult to find again, as they run very fast immediately they alight. A remarkable exception was the female I shot at Deering Creek, Central Australia, which I followed from bush to bush, and eventually shot from a branch about fifteen feet high."

An egg received by Mr. Kearland, referable to this species, for it is entirely distinct from any other Ground-Thrush's egg received from Central Australia, was taken by Mr. C. E. Cowle. It is a swollen-oval in form, the shell being close-grained, smooth, and slightly lustrous: of a dull white ground colour, thickly sprinkled over with irregular-shaped dots, spots, and small blotches of blackish-brown, intermingled with similar underlying markings of inky-grey, which predominate on the larger end:—Length 1.12 x 0.9 inches. This egg resembles a small swollen one of *Cinclosoma punctatum*.

Genus CINCLORAMPHUS, Gould.

Cincloramphus cruralis.

BROWN SINGING-LARK.

Megalurus cruralis, Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 228 (1826).

Cincloramphus cruralis, Gould, Bds. Austr., fol., Vol. III., pl. 74 (1848); *id*, Handbk. Bds. Austr., Vol. I., p. 391 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 498 (1883); *id*, Handl. Bds., Vol. IV., p. 26 (1903).

Cincloramphus cantillans, Gould, Bds. Austr., fol., Vol. IV., pl. 75 (1848); *id*, Handbk. Bds. Austr., Vol. I., p. 395 (1865).

ADULT MALE—(In breeding plumage): General colour above dark brown, each feather margined with pale fulvous-brown; rump brown; upper tail-coverts ashy-brown; upper wing-coverts like the back, the greater series externally margined with fulvous; quills brown, edged with pale fulvous-brown, whitish around the tips, the innermost secondaries darker brown, and externally more broadly margined with fulvous, like the greater wing-coverts; tail feathers brown, edged with whity-brown; head ashy-brown, the centres of the feathers slightly darker; a triangular-shaped patch in front, and the feathers below the eye black; ear-coverts brown, with fulvous-white shaft-lines; cheeks, chin, and throat blackish-brown; remainder of the under surface dusky brown; thighs pale brown; under tail-coverts dark brown, broadly margined with whity-brown; bill black; legs and feet fleshy-brown with a dusky wash; iris greyish-brown. Total length in the flesh 10 inches, wing 4.2, tail 4, bill 0.65, tarsus 1.6.

ADULT FEMALE—(In breeding plumage): Differs from the male in being much smaller and lighter in colour, the feathers of the upper parts slightly paler and broadly margined with fulvous,

* Handbk. Bds. Austr., Vol. i., p. 438 (1865).

† Bds. Austr., fol., Suppl., pl. 32 (1869).

the centres of the feathers on the head darker, and those on the hind-neck margined with whity-brown; lores, and a distinct eyebrow fulvous-white; in front of the eye a small brown spot; chin and throat dull white; remainder of the under surface pale fulvous white, with a brownish wash on the sides of the fore-neck and breast, most of the feathers having either a small spot in the centre or a dark brown shaft-line; centre of the lower breast and of the abdomen brownish-black; thighs and under tail-coverts fulvous-white, some of the latter centred with brown; bill fleshy-brown, darker on the culmen; legs and feet pale fleshy-brown. Total length in the flesh 7.2 inches, wing 3.1, tail 2.6, bill 0.55, tarsus 1.

Distribution — North-western Australia, Northern Territory of South Australia, Queensland, New South Wales, Victoria, South Australia, Western Australia.

THIS migratory species is found in one season or another in favourable situations in most parts of the Australian continent. In South-eastern Australia it usually arrives at the latter end of August, or early in September, and departs again in February. In New South Wales, however, its appearance is greatly influenced by the state of the season, for in periods of drought it is seldom seen, or only in diminished numbers; while after an abundant rainfall, when there is a luxuriant growth of grasses and herbage, it is tolerably common, and then may be absent from the same district for several years. It chiefly frequents open expanses of well grassed and pastoral lands, cultivation paddocks, and near the coast fern and heath-covered sandy wastes. At one time it used to frequent in the spring and summer months the low-lying fern and scrub-lands at the mouth of the Yarra River, near Melbourne, and it still occasionally visits Randwick and Botany, near Sydney. Although passing most of its time on the ground, this species frequently perches on a stump, fence, or tree, but at all times I have found it far more wary than its lesser congener *Calamanthus fulvescens*, and more especially the male during the breeding season.

The preceding descriptions are taken from a pair of birds shot at Kenmore, near Goulburn, New South Wales, by Mr. E. Payten, on the 13th November, 1900, which he forwarded to the Trustees of the Australian Museum on the following day, together with their nest and two eggs. An adult male, in similar plumage, was shot at Randwick by Mr. H. Newcombe on the 28th November, 1901. As a rule, however, adult males obtained in New South Wales during December, have more or less of the dusky-brown feathers of the under surface narrowly margined with pale ashy-brown, these margins gradually increasing in size throughout the late summer and the autumn months, until the centre of the breast is dusky-brown, and the remainder of the under parts ashy-brown, with the feathers of the throat and fore-neck mottled with dusky-brown. Individual variation, especially in the colour and markings on the under parts, however, exists in specimens obtained in the same month, and even in the same locality. Most of the adult males in the Australian Museum collection, obtained in New South Wales, with the under surface uniform dusky-brown, were procured in November. An adult male, obtained at Port Denison, Queensland, in the same month, has the chin, throat, and fore-neck ashy-brown, slightly tinged with dusky-brown, and the breast and abdomen only uniform dusky-brown. I cannot find any specific difference in specimens obtained in North-western Australia from others procured in New South Wales. Adult females differ very little in their winter and summer plumage. An adult female I shot on Weebollabolla Station, near Moree, on the 10th November, 1897, is similar to the one described above, but the feathers are more broadly margined with whity-brown, and it is barely through the moult. On their first arrival in New South Wales, at the end of August or early in September, they are paler and less mottled on the under surface. As pointed out by Gould, there is a great disparity in size in the sexes of this species, the female being very much smaller than the male.

Stomachs I have examined contained the remains of insects, principally beetles, and also the skins of caterpillars, and in some a few seeds.

The rich organ-like notes of the male are usually uttered while it mounts up high in the air, and is accompanied with a tremulous motion of the wings. They are extremely loud and melodious, and may be heard a considerable distance away. As a songster it ranks in New South Wales with the acclimatised Skylark (*Alauda arvensis*), which is common in the same haunts at Randwick and Botany. Captain Sturt, who in 1849 bestowed the vernacular name of "Singing-Lark" on this species, remarks: "This bird is good eating."

From Point Cloates, North-western Australia, Mr. Tom Carter writes me: "*Cincloramphus cruralis* is a common winter visitor, both on the coast and inland, where its loud cheerful song may be heard all day and sometimes at night. The nest, a neatly rounded structure, is placed in a tussock of grass, and eggs may be found from June to September, according to the season."

Dr. W. Macgillivray has kindly sent me the following notes: "*Cincloramphus cruralis* was very plentiful during the seasons 1897 and 1898, in the Hamilton District, Victoria, one or more pairs being met with in every well grassed paddock; during the two following years they were not nearly so numerous. One or two first appeared in September, but they did not become plentiful until October. They were soon occupied in nesting operations, and if any one desires to put his patience to the test, a search for this bird's nest can be recommended as an efficient means of doing so. On approaching a locality where there is a nest, the cock bird, generally perched on a fence, bush, or some other point of vantage, utters a few warning notes, then soars up into the air and passing over the nest warns the female to leave the nest; when assured of this he flies right away from the nest. The female usually leaves the nest very quietly, running through the grass some distance before taking flight, and as she is so much smaller and less conspicuous than her mate this action as a rule passes unobserved. The earliest record I have of eggs being taken is the 6th November, and the latest 15th December. After the eggs are hatched, the song of the cock bird ceases, and as soon as the young are able to fly, they leave the district for northern latitudes. I have not seen a single bird later than the 7th February, and most of them leave in January. I noted this bird for the first time in the Broken Hill District, New South Wales, on the 15th September, 1901. It soon became numerous, and engaged in domestic affairs. In 1902, owing to the drought and complete absence of all herbage, the place looking like a desert for forty miles around, no bird appeared. In 1903, rain did not fall until September, so that our spring was late and was continued owing to repeated falls of rain, until late in the summer, even now (25th February) the herbage is everywhere green. These birds were very numerous in October, and soon paired off for breeding purposes; they were in pairs all over the place until January. On 30th January the breeding season was evidently over, as I noted young and old birds in numbers amongst patches of "wild geranium," content there to feed on young grasshoppers. The crops of those shot contained mostly grasshoppers and a few other insects."

Mr. G. A. Kearthland writes me:—"Near my place at Preston, Victoria, I took a set of three slightly incubated eggs of *Cincloramphus cruralis* on the 1st January, 1904. I knew that the bird laid again, but did not find the nest. However, my son William was near the spot on the 11th February following. The old birds fluttered around him, and he discovered and eventually succeeded in catching a young one that was unable to fly far. This is very late breeding."

The nest of this species consists of a deep cup-shaped hole in the ground, lined entirely with dried grasses. An average one measures externally three inches in diameter by three inches and a half in depth. Usually it is formed close to or underneath a tuft of overhanging grass or weeds, and the hole is often made in a slanting direction so as to be more closely concealed by the surrounding vegetation.

* Exped. Cent. Austr., Vol. ii., App., p. 31 (1849).

The eggs are three or four in number for a sitting, oval in form, some specimens being rather pointed at the smaller end, and the shell is close-grained, smooth, and slightly lustrous. They vary in ground colour from a faint salmon-white to a dull reddish-salmon colour, which, as a rule, is almost obscured by numerous freckles or fleecy markings of a slightly darker tint, forming in some instances a zone around the larger end, in others so faint and thickly disposed as to be hardly distinguishable from the ground colour. A set of four, taken by the late Mr. K. H. Bennett, at Yandembah, on the 10th September, 1880, measures as follows:—Length (A) 0.02×0.03 inches; (B) 0.01×0.00 inches; (C) 0.01×0.04 inches; (D) 0.02×0.05 inches. A set of four, taken by Mr. A. M. N. Rose, at Campbelltown, New South Wales, on the 16th December, 1887, measures:—(A) 0.05×0.05 inches; (B) 0.02×0.00 inches; (C) 0.03×0.08 inches; (D) 0.04×0.07 inches.

The breeding season of this species in the inland portions of New South Wales is generally in September and October; and nearer the coast, November and December. The earliest and latest records I have of fresh eggs being taken in this State are given with the above-mentioned sets.

Young males resemble the adult male in its winter plumage, but the feathers of the upper parts, including those of the rump, also the upper tail-coverts, are margined with sandy-fulvous; an indistinct collar on the hind neck velvety-brown, with dark brown centres to the feathers; over the eye a fulvous stripe; chin and throat dull white, the latter mottled with dark brown; remainder of the under surface dull brownish-white, with small darker brown centres to the feathers, except those on the sides of the breast, which have only short indistinct streaks. Total length 8 inches, wing 4, tail 3, bill 0.5, tarsus 1.38.

Cincloramphus rufescens.

RUFous-RUMPED SINGING-LARK.

Anthus rufescens, Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 230 (1826).

Cincloramphus rufescens, Gould, Bds. Austr., fol., Vol. III., pl. 76 (1848); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 500 (1883); *id.*, Handb. Bds., Vol. IV., p. 26 (1903).

Ptenodus rufescens, Gould, Handbk. Bds. Austr., Vol. I., p. 397 (1865).

ADULT MALE—General colour above dark brown, each feather margined with fulvous-brown, those on the hind neck and sides of the neck with an ashy shade; lower back fulvous-brown indistinctly streaked with dark brown; rump and upper tail-coverts light rufous; upper wing-coverts like the back; quills dark brown with a rufous wash on the basal portion of their outer webs and narrowly edged for the remainder of their length with pale fulvous-brown, whitish around the tips of the inner secondaries; tail feathers brown narrowly edged with fulvous-brown; lores blackish, superciliary stripe dull white; ear-coverts pale brown; chin and throat dull white with a few dark brown spots near the lower throat; remainder of the under surface dull ashy-white, slightly tinged with fulvous, which is more pronounced on the abdomen, thighs, and under tail-coverts. Total length in the flesh 7.6 inches, wing 3.7, tail 3.25, bill 0.5, tarsus 1.1.

ADULT FEMALE—Like the male, but smaller; bill yellowish-brown, the under mandible paler. Total length in the flesh 6.5 inches, wing 3.2, tail 2.6, bill 0.47, tarsus 0.9.

Distribution—Northern Territory of South Australia, Queensland, New South Wales, Victoria, South Australia, Central Australia, Western Australia, North-western Australia.

IN favourable situations, the Rufous-rumped Singing-Lark appears to be generally distributed over the greater portion of the Australian continent. It usually arrives in New South Wales and Victoria about the same time as the preceding species, and departs again after the breeding season is over at the end of February. I have not observed it in New South Wales in the late autumn or early winter months, but Gould noticed it in South Australia in July, and

I procured specimens at Wellington and Dubbo, New South Wales, during the first week in August. It is, however, somewhat erratic in its appearance in the coastal districts, and may occur in numbers one season and be absent again for years. It used to be very common in the late spring and early summer months in the outlying suburbs of both Melbourne and Sydney, but it is now comparatively rare, and near the latter city it is seldom seen. Dr. W. Macgillivray informs me that it is very common on the downs in the Cloncurry District, Queensland, but he only noted occasional examples in the Hamilton District, Victoria. Mr. Tom Carter also informs me that at Point Cloates, North-western Australia, it is not nearly so numerous as *Cincoramphus crinalis*, and that he has only met with it inland.

Although this species usually frequents open forest and well grassed lands, specimens have been received by the Trustees of the Australian Museum from near the snow-line of Mount Kosciusko, the highest peak in Australia. During a trip made to the Gwydir River District, New South Wales, by Mr. J. A. Thorpe and myself, we found this species, with the exception of *Lalage tricolor*, the commonest in the bush. Open forest and ring-barked paddocks, with a profusion of knee-high herbage, were its favourite haunts. On a dead branch of nearly every tree was one or more of these birds, or they were disturbed from their cover while engaged in family cares. The preceding descriptions are taken from a pair of adult birds in breeding plumage, procured near the Gwydir River. Other adult birds, obtained at the same time, had no dark spots on the throat and fore-neck. The stomachs of the specimens we examined contained the remains of various insects and their larvæ.

The well known notes of the male are usually uttered when flying from tree to tree, or as it mounts up high in the air. They are among the richest and sweetest strains possessed by any Australian bird, and are poured forth as exuberantly as if the owner was revelling in ecstasy at his powers of song; when perched he occasionally varies them with a single clear call-note.

The nest is placed in a slight hollow in the ground, and is a small cup-shaped structure, externally formed of dried grasses, and generally lined with horse-hair when available. The inner cup of an average nest measures externally two inches and a half in diameter by one inch and a half in depth. Usually it is built under the shelter of a tuft of grass or weeds, or among the dead leafy branches of a fallen tree, and on several occasions I have taken it from underneath the overhanging bank of a dry creek. Near the Gwydir River, I found it placed amongst the luxuriant herbage, and one I had pointed out to me by Mr. C. J. McMasters at "Wilga," near Moree, was only a few yards away from his house.

The eggs are three or four in number for a sitting, varying from oval to rounded-oval in form, some specimens being rather pointed at the smaller end. In ground colour they vary from almost pure white to reddish and faint purplish-white, which typically is nearly obscured by numerous freckles, dots, or small irregular-shaped spots of rich reddish or purplish-brown, in some instances the markings predominating at the thicker end, where a more or less well-defined cap or zone is formed. Others have a few faint underlying markings of purplish-grey; while a rare variety now before me, has a nearly white ground, which is sparingly blotched with purplish-red intermingled with a few almost obsolete spots of lilac-grey. A remarkably handsome set of three have a distinct zone around the larger end of purplish-brown, and very minute pepper-and-salt markings of the same hue evenly distributed over the remainder of the shell. A set of three measures as follows:—Length (A) 0.8 × 0.6 inches; (B) 0.8 × 0.61 inches; (C) 0.81 × 0.61 inches. A set of four measures:—(A) 0.86 × 0.63 inches; (B) 0.85 × 0.63 inches; (C) 0.87 × 0.61 inches; (D) 0.85 × 0.63 inches. A set of small eggs measures:—(A) 0.76 × 0.6 inches; (B) 0.76 × 0.59 inches; (C) 0.77 × 0.58 inches.

The immature male resembles the adult, but the feathers of the back have dull rufous margins; the greater wing-coverts, quills, and tail feathers, too, are also margined with rufous; the eyebrow is not so distinct; the under surface has an ashy-grey shade; the feathers on the

fore-neck and upper breast have conspicuous brown centres, and the under tail-coverts are pale buff. Wing 3.35 inches.

The breeding season in New South Wales commences in September, in Victoria a month later, and continues until the middle of January. In both States, however, nests with eggs are more numerous in November. In Queensland, October and November appear to be the principal months for nests with eggs; but I have a set of three, taken in the Dawson River District, on the 25th February, 1893.

Genus PSOPHODES, *Figures de Horsfield.*

Psophodes crepitans.

WHIP-BIRD.

Muscicapra crepitans, Lath., Ind. Orn., Suppl., p. li, (1801).

Psophodes crepitans, Gould, Bds. Austr., fol., Vol. III, pl. 15 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 312 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII, p. 350 (1883); Handl. Bds., Vol. IV., p. 5 (1903).

ADULT MALE—*Head and nape black, remainder of upper surface olive-green; upper wing-coverts like the back; quills dusky brown, the outer primaries narrowly edged with brown, the remainder, also the secondaries margined externally with olive-green, increasing in extent towards the innermost secondaries, which have both webs olive-green; central tail feathers olive-green, the remainder blackish-brown, washed with olive-green on their outer webs, but less distinctly on the three outermost feathers on either side, which are tipped with white; lores, feathers below the eye, ear-coverts, and sides of the neck black; cheeks and sides of the throat white; chin, centre of the throat, and breast black; some of the feathers on the throat slightly edged with white, and those on the centre of the breast and abdomen broadly tipped with white, forming a conspicuous patch; sides of the body and abdomen ash-brown, slightly washed with olive-green; under tail-coverts dull olive-green; bill black; legs and feet dark reddish-brown. Total length in the flesh 10.75 inches, wing 5.5, tail 5.55, bill 0.8, tarsus 1.25.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—Southern Queensland, New South Wales, Victoria.

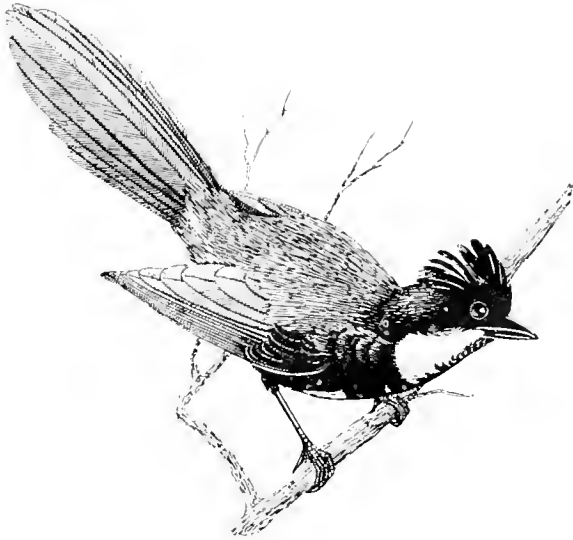
THE Whip-bird is generally distributed throughout the coastal brushes and humid mountain ranges of South-eastern Queensland, Eastern New South Wales, and Victoria. It gives decided preference for localities wherever ferns abound, and which are clothed with a dense and luxurious vegetation. Near Sydney it is tolerably common in the scrubby undergrowth of North Shore, Homebush Bay, and Cook's River, its range extending inland to the western slopes of the Blue Mountains. It is a rather shy and restless species, and may be generally seen traversing the low undergrowth in pairs, or hopping over the fallen leaves in search of various kinds of insects, which constitute its food. Sometimes it will leave these secure retreats and take up its residence in gardens close at hand, but never for any length of time or for the purposes of breeding. Although usually of a wary disposition, it is remarkably inquisitive, especially when young. At Roseville a youthful trapper informed me that on two occasions he had captured this species in traps baited with canary-seed for "Red-heads" (*Egitha temporalis*), but owing to their vigorous attacks on him with bill and claws, they had managed to escape. At my request to bring me the next Whip-bird caught, he returned five days later, on the 5th July, 1901, with a not quite adult male which he had trapped in a similar manner near Middle Harbour. It is more probable that it was allured to the trap by seeing the diminutive captive call-bird, than that it entered for the purpose of eating the grain.

The note of this species, from which it has received its vernacular name, is uttered by the male, and resembles "chuk chuk," followed by a rather prolonged and gradually rising hissing

whistle, terminating in a loud, clear, and vigorous "wh—p," the female answering immediately with a "chuk chuk," which would lead one to imagine that the response was part of her consort's note. Occasionally it is varied with a low squeaking or whining note, common to both sexes. In autumn the male usually utters only the beginning of his call, and does not conclude with the whip-like sound. It is seldom heard, also, when they venture out of cover; but on one occasion, in Goodlet's Bush, between Ashfield and Canterbury, I watched for half-an-hour a fine old male fearlessly and diligently searching the branches of some tall *Eucalypti* in quest of food; his mate, who was engaged in the same occupation in the bushes in the avenue, about thirty yards away, always responding to his call. This is the only instance in which I have known this species to resort to tall timber that afforded no concealment.

Although stated to be of uncertain size, Latham's prior description of White-checked Crow,* and his subsequent diagnosis of it, given in his "Index Ornithologicus" under the name of *Corvus olivaceus*, far more accurately describes the present species than does his later one of Coach-whip Flycatcher, characterised as *Muscicapa crepitans*. The latter description is

recognisable chiefly by the vernacular name and an account of the bird's habits.



WHIP-BIRD.

In describing *Psophodes crepitans* in the "Catalogue of Birds in the British Museum,"† Dr. Sharpe enumerates five specimens as having been collected at Cape York, one by Messrs. Cockerell and Thorpe, and four by Mr. Cockerell. Evidently Dr. Sharpe has overlooked the locality of these specimens, or he has regarded them as being wrongly localised, for he gives the habitat as "Victoria and New South Wales, extending along the east coast as high as Rockingham Bay." Mr. J. A. Thorpe, who prepared all the skins procured at Cape York by the late Mr. Cockerell and himself, informs me that *Psophodes crepitans* was never

obtained or even seen by them during their stay there. Neither has Mr. Bertie L. Jardine, who has resided there all his life, ever met with this species, nor *Ephthianura albifrons* and *E. tricolor*, also recorded in the same Catalogue as being obtained by Mr. Cockerell at Cape York.

The nest is an open structure, irregularly formed externally of long thin twigs or spiny stems and fibrous rootlets, the inner portion being cup-shaped and neatly lined with fine rootlets or the long thread-like leaves of the *Casuarina*, and sometimes with horse-hair, the rim of the nest being almost flat and of irregular width. An average nest measures externally six inches in diameter by two inches and a half in depth. The site selected for the nest is varied, but it is generally built two or three feet off the ground in a low shrub, the common Blackthorn (*Bursaria spinosa*) being particularly favoured in this respect in the neighbourhood of Sydney. Although usually well concealed, I have also found it in open parts of scrubs, near well frequented paths,

* Lath., Gen. Syn. Bds., Suppl. II., p. 118 (1801).

† Cat. Bds. Brit. Mus., Vol. vii., p. 351 (1883).

in tea-trees and turpentines, within hand's reach, and on one occasion twelve feet from the ground in the dead leafy top of a gum sapling that had the stem cut through close to the roots, and was held obliquely in position by falling across another partially-felled tree. At Enfield, in September, 1897, I found no less than six new nests, and all were hidden near the ground in the dead leafy tops of gum-trees, which had been felled in the densest part of the scrub. At Roseville, in August, 1903, a pair bred within a few yards of the back fence of my house.

The eggs are usually two, very rarely three in number for a sitting, oval or elongate-oval in form, the shell being close-grained, smooth, and slightly lustrous. They vary in ground colour from pale blue to a delicate bluish-white, over which are distributed small black spots and blotches, a few of them being duller in colour and appearing as if beneath the surface of the shell; others are boldly blotched, or the markings consist of crescents, figures, short wavy lines, and small irregular-shaped patches of black, predominating on some specimens at the thicker end, where they assume a more or less well defined cap or zone. A remarkably handsome broken egg of this species, which I found beneath a nest at Newington, had only a broad band formed of purplish-black cross-lines on the thicker end; others have numerous minute black dots and streaks, appearing as if they had been placed on the shell with a finely-pointed pen, and some are almost devoid of markings. As is ever the case with pale blue eggs having semi-transparent shells, the eggs of this species are more beautiful and of a deeper ground colour immediately after being emptied of their contents, but when perfectly dry this richness fades out, and the same tint is assumed as when first found in the nest. A set taken at Enfield on the 13th September, 1893, measures: (A) 1.15×0.77 inches; (B) 1.12×0.78 inches. Another set of two, taken on the 22nd December, 1897, measures alike 1×0.75 inches. A set of two, taken at Chatswood on the 7th September, 1898, measures: (A) 1.08×0.73 inches; (B) 1.09×0.75 inches.

The female seldom sits so close as to be flushed from the nest unless it contains eggs in an advanced stage of incubation; but the cries of both birds haunting the spot are almost certain indications that they have a nest, or young ones, in the vicinity. When their nests are built low down, many old birds are killed by cats or other enemies. While collecting near the Parramatta River with Mr. S. W. Moore, on the 2nd September, 1893, we found four nests of this species with the eggs recently broken, and a quantity of the body and tail feathers of an adult bird strewn underneath each nest. Later on in the afternoon, Mr. Moore saw a large domestic cat in the scrub, evidently run wild, and which we believed to be the destroyer of these birds.

When the young are just able to leave the nest, should any one approach near them, all shyness is thrown off by the old birds, and they exhibit every symptom of parental solicitude for their family. With outspread wings and expanded tail they run hither and thither through the scrub, uttering at the same time harsh grating cries of distress. The young are, however, adepts in concealing themselves among the thick undergrowth or under débris. Attracted by the cries of one I caught at Eastwood, the old birds ventured so close that I could have almost captured them with my hands before I restored the young one to liberty.

Fledgelings are of a uniform rich brown, and acquire a slight olive tinge on the back and a distinct olive wash on the upper tail-coverts and tail shortly after leaving the nest. Slightly older birds have the crest feathers dark brown, the back and tail more strongly washed with olive-green, the latter also having the three outermost feathers indistinctly tipped with white; all the under surface ashy-brown with a reddish wash to the feathers. Some time elapses before young birds acquire the black head and crest, white cheeks, and white feathers on the centre of the body like the adult.

The nest here figured, I found when it was about half built, on the 7th September, 1898, in some undergrowth a foot from the ground, in a gully at Chatswood. Three days later it was lined with finer materials, and on the 14th September it contained two fresh eggs. It is irregularly formed of long thin twigs; the inside, which is cup-shaped, being lined with the thin wiry dried leaves of *Casuarina suberosa*, and a small quantity of horse-hair. Externally it averages six inches and a half in diameter by two inches and a half in depth, and the inner cup two inches and three-quarters in diameter by one inch and a half in depth. I found another nest of the same pair of birds on the 3rd October following. It was built near the top of a small turpentine, and was about ten feet from the ground.



NEST AND EGGS OF WHIP-BIRD.

The breeding season of this species usually commences about the middle of July, and continues until the end of January, but nests with eggs are more common in September and October. I have found nests, however, containing fresh eggs as early as the 6th July and as late as the 22nd December. If successful in rearing their young, the nest of the same pair of birds may be found a few feet away from the old one, either for the second brood, or again in the following season.

A smaller race of *Psophodes crepitans* inhabits the Bellenden Ker Range of North-eastern Queensland, which I have characterised under the name of *Psophodes lateralis*.^{*} Specimens from this part of Queensland may be distinguished from *P. crepitans* in having the wings longer, the tail shorter, and the outermost feathers of the latter tipped with pale brown instead of white. An average specimen measures 9·8 inches, wing 3·95, tail 5, bill 0·85, tarsus 1·2. Mr. R. Grant, who obtained several of the specimens in the Australian Museum Collection, informs me that he could not detect any difference in the note of this bird, neither is there any difference to be found in the colour and size of their eggs from those of the typical species.

^{*} Rec. Austr. Mus., Vol. iii., p. 13 (1897).

Mr. E. H. Webb writes me: "*Psophodes crepitans*, subsp. *lateralis*, is very common in the scrubs along the Russell River, and towards Bellenden Ker. It appears to breed very early. In August, 1903, I found many nests containing young, or nests that had been recently deserted, but did not succeed in obtaining one with eggs. The nests resembled those of *Psophodes crepitans*, but more strongly built if anything. They were usually built low down in a *Calamus* thicket, and very difficult to find."

Psophodes nigrigularis.

WESTERN WHIP-BIRD.

Psophodes nigrogularis, Gould, Proc. Zool. Soc., 1844, p. 5; *id.*, Bds. Austr., fol., Vol. III., pl. 16 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 314 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 351 (1883); North, Vict. Nat., Vol. XVI., p. 11 (1899).

Psophodes nigrigularis, Sharpe, Hand-l. Bds., Vol. IV., p. 5 (1903).

ADULT FEMALE—*General colour above dull yellowish-olive; upper wing-coverts like the back; quills dark brown, their outer webs dull yellowish-olive, except those of the outer primaries, which are narrower and indistinctly edged externally with dull yellowish-olive near their base and pale brown towards the tips; upper tail-coverts slightly brighter in colour than the back; tail feathers dull yellowish olive, the lateral feathers crossed near their extremity with a blackish-brown band and tipped with white; head and nape brown; lores and a narrow ring of feathers around the eye dull white; ear-coverts brown with indistinct whitish shaft lines; chin, throat, and centre of the fore-neck dull black enclosing a white stripe which extends from the base of the lower mandible on to the sides of the throat; remainder of the under surface ashy brown; centre of the breast and the abdomen whitish, some of the feathers of the breast mottled with black; sides of the chest, the flanks, and the under tail-coverts brown, slightly washed with yellowish olive; thighs brown; bill (of skin) dark brown, pale brown towards the tip of upper mandible and the centre of lower mandible. Total length 7.5 inches, wing 3.1, tail 4.5, bill 0.8, tarsus 1.05.*

ADULT FEMALE—*Similar to the male, but having the throat only dull black, and the feathers on the centre of the breast and the abdomen light ashy brown.*

Distribution.—Western Australia.

THIS species was described by Gould in the "Proceedings of the Zoological Society of London," in 1844, from a single specimen obtained by Gilbert in South-western Australia. Apparently it is still a rare species in European and British collections, for in the "Catalogue of Birds in the British Museum," Dr. Sharpe transcribes Gould's original description. Mr. George Masters, while collecting at King George's Sound on behalf of the Trustees of the Australian Museum, obtained adults of both sexes, from which the above descriptions are taken, also young birds, in September, October, and November, 1868. Mr. Masters informs me that this species inhabits the thickest parts of scrub-lands. Although he procured eight specimens, it is a most difficult bird to shoot, owing to its being excessively shy and wary. When viewed in certain lights, the under surface of the tail feathers exhibit a distinct golden-green sheen.

Two eggs of this species in Mr. G. A. Keartland's collection, were taken by Mr. J. Harris from a small saucer-shaped nest, built of twigs, and placed in low scrubby undergrowth near Bunbury, in December, 1898. They are indistinguishable from some eggs of its larger eastern representative, *Psophodes crepitans*. One specimen is oval in form and of a pale bluish-white ground colour, with dots, spots, and small irregular-shaped blotches and dashes scattered over the shell, but more thickly disposed on the larger end, where some of the marks are confluent, and are

intermingled with a few underlying streaks and spots of faint bluish-grey. Length 1.06×0.78 inches. The other egg is an elongate-oval in form, exceeding in length average specimens of *P. crepitans*, and is of a pale greenish-white ground colour, with irregular-shaped spots, dashes, and short linear streaks of black distributed over the surface of the shell, some of the dots and spots running in nearly straight lines; in other places they are in small clusters:—Length 1.2×0.78 inches.

Young birds resemble the adults, but are destitute of the black throat and white cheek stripe, these parts being ashy-brown slightly tinged with yellowish-olive.

Genus SPHENOSTOMA, Gould.

Sphenostoma cristatum.

CRESTED WEDGE-BILL.

Sphenostoma cristatum, Gould, Proc. Zool. Soc., 1837, p. 150; *id.*, Bds. Austr., fol., Vol. IV., pl. 17 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 316 (1865); Gadow, Cat. Bds. Brit. Mus., Vol. VIII., p. 74 (1883); Sharpe, Hand-l. Bds., Vol. IV., p. 342 (1903).

ADULT MALE—General colour above brown, tinged with fulvous; upper wing-coverts brown, darker in the centre, and externally margined with fulvous-brown; primary-coverts dark brown;



CRESTED WEDGE-BILL

edge of the wing whitish; quills dark brown, the fourth and fifth primaries externally margined on their outer webs with white, except at the tips, the remainder indistinctly edged with brown, and the innermost secondaries conspicuously margined with pale brown; two central tail feathers brown, the next pair dark brown tipped with white, the remainder brownish-black tipped with white, the basal portion becoming darker and the tips larger towards the outermost feather; apical portion of crest feathers dark brown; sides of the head and ear-coverts brown; all the under surface pale brown, whitish on the chin and centre of the throat, and slightly darker brown on the sides of

the body; under tail-coverts brown with white tips; bill black; legs and feet greyish-black; iris brown. Total length 7.8 inches, wing 3.3, tail 4, bill 0.55, tarsus 0.9.

ADULT FEMALE—Similar in plumage to the male.

Distribution.—Queensland, New South Wales, South Australia, Western Australia, North-western Australia.

IN Eastern Australia, the Crested Wedge-bill is strictly an inhabitant of the inland portions of the continent, but in Western Australia it is also found near the coast. There is a variation in the depth of colour in this species, some examples having that bleached appearance found in birds inhabiting very hot and arid districts, although this is not always the case. The darkest specimen in the Australian Museum collection is an example procured by Mr. George Sharpe at Kanowna, about seventy-five miles to the north-east of Kalgoorlie, Western Australia, and is furthermore distinguished by the under surface having a distinct reddish-buff shade. The wing-measurement of adult males varies from 3.2 to 3.45 inches.

Mr. G. A. Keartland writes me:—“*Sphenostoma cristatum* is found throughout the interior of Central and North-western Australia, wherever scattered scrub or low bushes abound. It is

a rather shy and wary bird, and would seldom be found but for its tinkling notes, which are frequently heard as early as 3 a.m. and long after dark at night. On moonlight nights they sing at any time. They are generally found in pairs, but it is remarkable how often a young male, with a horn-coloured bill, is found apparently mated to an old female, and *vice versa*. They are very active on the ground and amongst the foliage of low scrub. Whether feeding or perched they sing nearly all the time. They build a very neat saucer-shaped nest, nicely lined with fine grass, in a low bush at from one to three feet from the ground. Sometimes only one egg is laid, but last season Mr. Cowle sent me a set of three.

Dr. W. Macgillivray has sent me the following note from Broken Hill, in south-western New South Wales:—"I have only seen one example of *Sphenostoma cristatum*, a male, which I shot from a stunted acacia on one of the many dry creeks amongst the ranges near here. Mr. Wm. Gayer, a friend of mine, whilst travelling from Broken Hill with some sheep to his father's station near Wilcannia, found this bird breeding in the mulga scrub fifty miles north from here. He describes the nest as being placed in a thick clump of mistletoe, about six feet from the ground, the nest being composed of twigs and twining plants, with a fine lining of the same material, and was an open cup-shaped structure. It contained two eggs, and was taken on 14th October, 1901."

From Point Cloates, North-western Australia, Mr. Tom Carter writes me:—" *Sphenostoma cristatum* is a remarkably wary and difficult bird to shoot. Its loud metallic ringing song may be heard in the winter months in the dense 'minga' bush, both on the coast and inland; on the slightest noise, however, the song ceases, and the bird either skulks out of sight or flies stealthily away to renew its song in another thicket. I have often wondered how this bird can continue its rapid song for such a length of time without a pause. In the early winter mornings it is delightful to hear several of these birds in different parts of the bush, singing one against another. The eggs, two or three in number, may be found in an open cup-shaped nest, in July or August."

The nest is an open cup-shaped structure, of very thin twigs, dried plant stems, tendrils, and rootlets, the inside being lined with a small quantity of greyish-white bark fibre, and very fine wiry rootlets. One received from Mr. C. E. Cowle, has the inner wall formed of fine soft greyish-white grasses, and is thinly lined with fine yellowish-brown rootlets. It averages externally five inches in diameter by two inches in depth, the inner cup measuring two inches and three-quarters in diameter by one inch and a half in depth. The nests are usually built in thick brushes, within a few feet of the ground, and occasionally in low scrub trees at a height of six feet.

Mr. C. E. Cowle also kindly forwarded, through Mr. Kearland, another nest and eggs of this species, taken by him at Ilamurta, Central Australia, together with the following notes:—" *Sphenostoma cristatum* is pretty plentiful here all the year round. It breeds in January, February, and March, but I took a nest with eggs in September, 1898. It makes a rather insecure, open, cup-shaped nest, composed of small twigs and tops of salt-bush, and is generally found in an ironwood, not far from the ground."

The eggs are usually two, rarely three in number for a sitting, oval in form, the shell being close-grained, smooth, and slightly lustrous. Typically they are of a rich greenish-blue ground colour, which is minutely dotted, spotted, and sparingly blotched with black, particularly on the larger end of the shell, closely resembling the eggs of the introduced Song Thrush (*Turdus musicus*), from which they differ only in their smaller size, and the markings being of irregular shape. Another less common variety is of a pale delicate blue ground colour, and having a wreath formed on the larger end, with small irregular-shaped blotches of dull blackish-brown, intermingled with fainter underlying streaks and dashes of inky-grey. Some specimens have the

markings uniformly distributed over the surface of the shell, but as a rule they are confined almost entirely to the thicker end. For the first two sets of eggs I received of this species, I was indebted to the late Mr. W. Liscombe, who found this bird breeding near Wilcannia in October, 1882, and later on in the same year at Adavale, Queensland. The former set measures:—Length (A) 1.03×0.68 inches; (B) 0.97×0.67 inches. A set of three from the same locality, in Mr. G. A. Kearland's collection, measures:—Length (A) 0.9×0.64 inches; (B) 0.93×0.60 inches; (C) 0.92×0.67 inches. A set of two, taken by Mr. Cowle on the

27th December, 1902, measures:—Length (A) 1×0.68 inches; (B) 0.98×0.7 inches. An egg of this species in the Australian Museum collection, taken by one of Sir Thomas Mitchell's party, during his expedition to the Darling River in 1835, measures 1×0.71 inches.

The nest and eggs here figured were presented to the Trustees of the Australian Museum by Mr. C. E. Cowle, who sent the following note with them:—"I am sending a nest and two eggs of the Crested Wedge-bill, which I took in a dead *Cassia phyllodinea* bush on the



NEST AND EGGS OF CRESTED WEDGE-BILL.

27th December, 1902, at Illamurta, Central Australia. This nest is more finished than any I have seen before, and was built between some thin upright forks, about four feet from the ground."

Genus EPHTHIANURA, Gould.

Ephthianura albifrons.

WHITE-FRONTED NUN.

Acanthiza albifrons, Jard. & Selby, *Illustr. Orn.*, Vol. II., pl. 56.

Ephthianura albifrons, Gould, *Bds. Austr.*, fol., Vol. III., pl. 64 (1848); *id.*, *Handbk. Bds. Austr.*, Vol. I., p. 377 (1865); Sharpe, *Cat. Bds. Brit. Mus.*, Vol. VII, p. 666 (1883); *id.*, *Hand-l. Bds.*, Vol. IV., p. 148 (1903).

ADULT MALE—General colour above dull grey, some of the feathers on the back indistinctly centred with dark brown; rump clear grey; upper wing-coverts dark brown, the lesser coverts edged with grey; quills dark brown, blackish-brown on the outer webs of the primaries; upper tail-coverts black; tail feathers dark brown, all but the central pair with a large white spot at the end of the inner web; hinder portion of crown and nape black; forehead, sides of the head, cheeks, and throat

white; a broad collar across the chest black, narrower in the centre, and extending at the sides upwards across the neck and joining the black feathers on the nape; remainder of the under surface white; sides of the body tinged with grey; thighs dark brown; under tail-coverts white; bill black; legs and feet black; iris pale yellowish-buff. Total length in the flesh 4.6 inches, wing 2.8, tail 1.6, bill 0.4, tarsus 1.2.

ADULT FEMALE.—Duller in colour than the male. General colour above ashy-brown; the head and hind-neck distinctly shaded with grey; wings brown, darker on the innermost secondaries, the quills externally edged with pale brown; tail feathers brown, all but the central pair with a spot of white at the tip of their inner web; lores whitish; ear-coverts light ashy-brown; cheeks, throat, and all the under surface dull white, crossed by a narrow smoky-black band on the fore-neck; under tail-coverts white.

Distribution.—Southern Queensland, New South Wales, Victoria, South Australia, Western Australia, North-western Australia, Tasmania, and some of the islands of Bass Strait.

THE range of the present species extends in favourable situations over the greater portion of Southern Australia; it likewise inhabits some of the larger islands of Bass Strait, and Tasmania. Near the coast, it chiefly frequents estuarine areas and marshy grounds dotted



WHITE-FRONTED MUN.

here and there with tufts of rushes, and sand wastes covered with low bracken fern or stunted vegetation; also partially-cleared lands and cultivation paddocks. Inland it may be met with on open grassy plains, but more often on the margins of rivers and lightly timbered lands. In New South Wales and Victoria it is found throughout the year, but it is more abundant in some seasons than others, when it congregates in large flocks of one hundred or more in number. Generally this is in autumn, after the normal breeding season is over, or again in the winter months. Most of its time is passed on the ground, searching for insects which constitute its food. When perched on the summit of some low bush, also during flight, it frequently utters a peevish kind of note. In the vicinity of Adelaide this species is known as "Tin-Tac." Near Sydney it is known as

the "Ring-neck," and "Nun," from its plumage.

Dr. A. M. Morgan, in July and August, 1900, found this species very common between Port Augusta and Mount Gunson, in South Australia, moving about in flocks up to forty or fifty in number. It was only seen on flats and table-lands, and no new nests were found, the residents informing him that this species, as well as *Ephthianura tricolor*, had finished breeding.

Dr. W. Macgillivray informs me that in the Broken Hill District, in south-western New South Wales, this bird is present throughout the year, but is especially numerous in autumn and winter, few, however, seem to remain to breed.

From Point Cloates, North-western Australia, Mr. Tom Carter writes me:—"*Ephthianura albifrons* is a casual visitor to the coast. Numbers were seen here on 14th February, 1899, also on 10th May following, and a few stragglers between dates."

Eight specimens were collected by Mr. K. Broadbent in Tasmania. Dr. Lonsdale Holden has also frequently observed this species at Bellerive and Rokeby, near Hobart, and found a nest, with three eggs, in a brush fence on the road to Ralph's Bay, on 11th November, 1895, and another in a small bush at Rokeby on the 23rd October, 1898.

The nest is an open cup-shaped structure, irregularly formed exteriorly of coarse dried grasses or plant-stalks, and is neatly lined inside with fine dried grasses, thin fibrous rootlets, and horse-hair. The nests vary somewhat with the materials of which they are formed, according to their position. Those built in low bracken fern usually have small portions of the dead fronds in their outer walls. One I found had a piece of coarse string worked into the side, and others were lined almost entirely with cow-hair. Where available, however, horse-hair is chiefly used as a lining. An average nest measures three inches and a half in external diameter by three inches in depth, and the inner cup two inches and a quarter in diameter by one inch and a half in depth. The site selected for the nest is varied. Usually it is near the ground, and placed in a low bush, or among bracken fern, the centre of a clump of rushes, under the shelter of a thistle, and—when built near the margin of a swamp—often in low coarse spiny grass, just sufficient to conceal the structure. I have also found them built in the acclimatised Pine (*Pinus insignis*), and on one occasion at the mouth of the Yarra River, near



NEST AND EGGS OF WHITE-FRONTED NUN.

Melbourne, in a *Melaleuca*, eight feet from the ground. The position of this nest, which contained three fresh eggs, also an egg of *Lamprococcyx basalis*, was rendered more peculiar by the near proximity of belts of bracken fern, where these birds were breeding in scores, several nests with eggs being found within a few feet of each other. A nest in the Group Collection of the Australian Museum, I took on the 12th September, 1891, within a few yards of the edge of the cliffs, near Bondi. The nests are easily found, for usually the birds sit close, and when flushed resort to the common device to draw an intruder away, fluttering along the

ground in a seemingly helpless manner, or perching on the top of a low bush, or fence a few yards distant, seldom a tree, and uttering low notes of distress.

The nest and eggs figured were found by Mr. C. G. Johnston at Chatswood on the 22nd August, 1898. The nest was built eighteen inches from the ground, among some *Pteris aquilina* and against the low stump of a *Casuarina suberosa*, from which some new growth had shot out. It is irregularly formed of dried coarse grass-stalks, and portions of fronds of *Pteris aquilina*, the inside being neatly cup-shaped and lined with wiry rootlets, cow-hair, and horse-hair. Externally it measures three inches and a half in diameter by three inches in depth, the inner cup measuring two inches and a quarter in diameter by one inch and a half in depth. It contained three fresh eggs.

The eggs are usually three, sometimes four in number for a sitting, varying from oval to rounded and slightly elongate-oval in form, the shell being close-grained, smooth, and lustreless. Typically, when fresh, they are of a faint reddish-white ground colour before being blown, but

when emptied of their contents become pure white, and have dots and spots of dark reddish-brown or rich purplish-red, particularly on the larger end, where in rare instances they form an ill-defined zone. In some specimens the markings are rounded, in others they are of irregular shape, and many are confluent, forming small patches. A few have short streaks, others clusters of very small dots, and one now before me has a single comet-shaped marking on the larger end. Some have the ground faintly tinged with red, but in a remarkable set of four I took at Canterbury, New South Wales, on the 15th November, 1892, three of them are of a very faint creamy-buff, dotted and spotted with rich purplish-brown, the other is pure white and similarly marked with pale pinkish-red. This set measures:—(A) 0.66×0.55 inches; (B) 0.69×0.54 inches; (C) 0.7×0.54 inches; (D) 0.7×0.55 inches. A set of three, taken on the 29th October, 1892, in the same paddock as the above set, measures:—(A) 0.78×0.53 inches; (B) 0.75×0.52 inches; (C) 0.74×0.52 inches. A set of three, taken by Dr. L. Holden on the 23rd October, 1898, at Rokeby, Tasmania, measures:—Length (A) 0.77×0.54 inches; (B) 0.72×0.5 inches; (C) 0.73×0.55 inches. Mr. E. H. Lane informs me that he has a set of five eggs in his collection that was taken by Mr. Charles Spicer on the 6th December, 1899, at Lewis Ponds, about twelve miles from Orange, New South Wales.

Fledgelings resemble the female in colour, but the upper parts have a distinct buffy tinge, which is more conspicuous on the rump; wings dark ashy-brown, the greater coverts and quills margined with buff; all the under surface dull white, slightly washed with buff on the throat, chest, and sides of the body, and with an indication of a narrow brown band on the fore-neck, which is apparent in the young male before it leaves the nest. Wing 2 inches.

There is a beautiful albino of *Epthianura albigens* in the Australian Museum, obtained at Western Port, Victoria.

The breeding season in South-eastern Australia extends over the greater part of the year. In New South Wales, nests with fresh eggs may be found from July until the end of December, but are more numerous in September. Probably three or more broods are reared, for in the neighbourhood of Sydney, during the bright clear days of March, I have on two occasions found their nests with fresh eggs,—one on the 4th March, 1892, and the other on the 23rd March, 1893. At St. Kilda, in Victoria, I found a nest built in the acclimatised Cape-weed, containing three fresh eggs on the 30th June, and on the following day, at the mouth of the Yarra River, found more than twenty in low bushes and bracken fern, containing from one to three eggs in each. The male sometimes assists in the task of incubation. At Canterbury, New South Wales, on the 15th November, 1892, while walking among some rushes, I flushed a male from a tuft where I found it had been sitting on four fresh eggs. Although he perched on the top of a bush a few yards away, and remained there some time uttering his plaintive notes, the female did not respond to his call nor did I see her.

As I have previously pointed out, this species is one of the foster parents of the Rufous-tailed Bronze Cuckoo (*Lamprolaima basalis*). I once saw a bird in pursuit of another, both of which alighted on a fence near my house. The larger one proved to be a fledgeling of *L. basalis*, who, with outspread wings, was eagerly clamouring for food, and although repeatedly fed by its diminutive foster-parent, it seemed all the time I watched it, to be suffering from the pangs of incessant hunger.

Ephthianura tricolor.

CRIMSON-BREASTED NUN.

Ephthianura tricolor, Gould, Proc. Zool. Soc., 1840, p. 159; *id.*, Bds. Austr., fol., Vol. III., pl. 66 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 380 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 351 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 148 (1903).

ADULT MALE.—*General colour above ashy-brown, the nape and back dusky blackish-brown; upper wing-coverts like the back, the median and greater series with paler edges and margined with white around the tips; primaries brown, narrowly edged externally with brownish-white, the secondaries dark brown with whitish margins and tips; rump and upper tail-coverts crimson; tail feathers dark brown with a slight blackish wash, all but the central pair with a spot of white at the end of the inner web; crown of the head crimson; lores, feathers around the eye and the ear-coverts blackish-brown; chin and throat white; remainder of the under surface bright crimson, the bases of the feathers grey and their central portion white; abdomen and under tail-coverts white; vent white, the tips of the feathers scarlet; bill blackish-brown; legs and feet blackish-brown; iris yellowish white. Total length in the flesh 4.5 inches, wing 2.75, tail 1.5, bill 0.5, tarsus 0.75.*

ADULT FEMALE.—*Duller in colour than the male. General colour above brown; the wings and tail not quite so dark as in the male; rump and upper tail-coverts dull crimson; head and ear-coverts ochreous-brown; all the under surface whitish, slightly washed with ochreous brown on the lower throat and sides of the body, and crimson on the breast.*

Distribution.—Queensland, New South Wales, Victoria, South Australia, Central Australia, Western Australia, North-western Australia.

THIS is a strictly migratory species, arriving in the inland portions of New South Wales during the month of October, and departing again after the breeding season is over, usually at the end of January or early in February. Captain Sturt, who met with it in North-western New South Wales, states it evidently migrates from the north-west, and that about February and the beginning of March it collects in large flocks, preparatory to making the return journey.

Mr. J. A. Thorpe and I found it fairly plentiful between the Namoi and Gwydir Rivers, during November, 1897, frequenting alike lightly-timbered scrub, open forest country, and the clumps of low bushes dotted about the plains. They were breeding at the time of our visit, and the females were frequently flushed from their nests in the long grass or low bushes as we drove over the plains. The brilliantly-plumaged males, however, were exceedingly shy and wary, and seldom allowed of a near approach. When disturbed on the outskirts of the scrub, they often sought refuge on the lower branches of some lofty *Eucalypti* in the vicinity. In the southern and western portions of the State I found them far more sociable and easy to procure. Unlike its congeners, *Ephthianura albifrons* and *E. aurifrons*, the present species is entirely independent of water, even on the hottest day. Its appearance, however, is greatly regulated by the season. During the protracted drought of 1897, they were observed for the first time in thirty years on Wambangalang and Buckiinguy Stations, on the Bogan and Narran Rivers, New South Wales, where in both instances they remained to breed.

The food of this species consists entirely of small insects and their larvæ. On Yandembah Station, the late Mr. K. H. Bennett kept some of these birds in an aviary, feeding them on caterpillars and small shreds of meat, but in an unhappy moment he introduced into their cage a pair of *Dacelo gigas*, who quickly terminated the existence of the smaller birds.

There is but little difference in the wing-measurements of adult males. Some adult females may be found with dull crimson feathers on the forehead, crown of the head, or ear-coverts.

In this stage of plumage, they cannot be distinguished, except by dissection, from young males; but some birds are much richer and darker in colour than others, even when procured at the same time and in the same locality.

Dr. W. Macgillivray informs me that this species is numerous in the Cloncurry District, Northern Queensland, during wet seasons, and breeds in small bushes on the plains in March and April. Writing me from Broken Hill, in South-western New South Wales, he remarks:—"*Ephthianura tricolor* I first noted here on the 13th October, 1901, but it soon increased in numbers. The nests are built of fine herbage and roots, much like those of *E. aurifrons*. I have three before me now, taken near a dwelling; one is almost wholly composed of horse-hair, another of string,



NEST AND EGGS OF CRIMSON-BREASTED NUN.

and the third mainly of the natural material with an admixture of feathers and horsehair. *E. tricolor* and *E. aurifrons* are not here during the winter, even when conditions of living are favourable, as in 1901."

The accompanying figure is reproduced from a photograph, taken by the late Mr. H. P. C. Ashworth, to whom I am indebted for the loan of this, as well as many other interesting pictures. Writing me in 1897, he remarked:—"The nest of *Ephthianura tricolor* was taken in December, 1897, in Caldwell's Vineyard, near Wagga Wagga, New South Wales. The nests were very plentiful, and as

one walked among the vines, the hen-birds would tumble out in front of one, and drag an apparently broken wing along the ground while in the vicinity of the nest, the cock-birds in the meantime flying anxiously from stake to stake."

From Illamurta, Central Australia, Mr. C. E. Cowle writes me:—" *Ephthianura tricolor* seems to arrive with the approach of warm weather, and disappears during winter. I would not like to say that they leave altogether, as I have observed them in August. One often sees little mobs of dull plumaged birds which all look like females, and I have often tried to find out from the blacks where the males are; they reply, 'him only piccaninny, by-and-bye flash one.' The birds appear to me to be adults, though. This species breeds from December to April, inclusive, building a neat, round, open nest in a porcupine-bush or cotton-bush, or any low shrub, and usually lay three or four and sometimes five eggs, which vary a lot as to the markings on them."

Mr. Tom Carter sends me the following note from Point Cloates, North-western Australia:—
Ephthianura tricolor is one of our commonest winter visitors, but it is more numerous some seasons than others. It was very abundant in 1898—a hurricane year. Usually it appears after our first winter rains, and breeds during July, and sometimes again after rain in March, laying three or four eggs. On 6th March, 1898, I took a nest with three eggs, also an egg of *Lamprolaima basalis*; another, on the 16th July following, with three eggs; one, with three eggs, on the 13th July, 1899; also one on the 14th July, 1901, containing four eggs."

The nest is an open structure, irregularly formed externally of the flowering stalks of herbaceous plants, wiry rootlets, or coarse grass-stems; the inner portion, which is cup-shaped, being lined with very fine rootlets, and when available a small quantity of horse-hair. An average nest measures externally four inches in diameter by two inches and a quarter in depth, the inner cup measuring two inches and a quarter in diameter by one inch and a half in depth. Like the nests of *Ephthianura albigula*, they vary much in their outer dimensions, some being broad-rimmed on one side of the structure only, forming a kind of small platform, others being uniform in size and evenly formed throughout. One found at Moree had small nodules of earth attached to the coarse rootlets with which it was externally formed. The nest is usually built in a low shrub, or bush, near the ground, and occasionally under the shelter of dwarf herbage.

The eggs are usually three, sometimes four, and in rare instances five in number for a sitting, oval in form, the shell being close-grained, smooth, and in some specimens slightly lustrous. They are of a rich fleshy-white when fresh and before being blown, pure white afterwards, sprinkled over with small dots and spots, varying from rich red to purplish-red and reddish-black. As a rule, the markings are smaller and darker than those found on *E. albigula*, and predominate on the thicker end, but seldom form even an imperfect zone. A set of three, taken by Mr. J. A. Thorpe at Moree, on the 9th November, 1897, measures as follows:—Length (A) 0.62 × 0.5 inches; (B) 0.61 × 0.48 inches; (C) 0.63 × 0.49 inches. A set of three, taken by Mr. C. E. Cowle, on the 7th December, 1895, on Missionary Plain, Central Australia, measures:—(A) 0.68 × 0.5 inches; (B) 0.67 × 0.48 inches; (C) 0.68 × 0.49 inches.

In New South Wales, nidification begins shortly after the arrival of these birds in October, the eggs being usually laid towards the latter end of that month, or early in November, but the late Mr. H. P. C. Ashworth found nests with eggs in December.

***Ephthianura aurifrons*.**

ORANGE-FRONTED NUN.

Ephthianura aurifrons, Gould, Proc. Zool. Soc., 1837, p. 148; *id.*, Bds. Austr., fol., Vol. III., pl. 65 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 380 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 668 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 148 (1903).

ADULT MALE—General colour above dull yellow, the feathers of the hind-neck and back having dark brown centres; upper wing-coverts dark brown, margined with yellow; primaries brown, narrowly edged with yellow, the secondaries dark brown with whitish tips, and externally margined with yellow; lower rump and upper tail-coverts bright yellow; tail feathers blackish-brown edged with yellow, more broadly at the base, all but the central pair with a large white spot at the tip of the inner web, the outer web of the outermost feather on either side dull white; crown of the head rich golden-yellow, deeper in colour on the forehead, and gradually passing into yellow on the nape which is streaked with brown; ear-coverts golden-yellow; lores, feathers below the eye, and the throat black; remainder of the under surface golden-yellow, slightly paler on the sides of the body; under tail-coverts yellow; bill black; legs and feet blackish-brown; iris orange. Total length 4.3 inches, wing 2.5, tail 1.5, bill 0.45, tarsus 0.72.

ADULT FEMALE.—Differs from the male in being brown above, the head with a slight ochreous shade; lower rump and upper tail-coverts yellow; upper wing-coverts and quills brown, having smaller and less distinct pale margins; all the under surface dull white washed with yellow, less distinctly on the throat and deeper in tint on the centre of the abdomen; the fore-neck shaded with ashy-brown; under tail-coverts yellow.

Distribution.—Queensland, New South Wales, Victoria, South Australia, Central Australia, Western Australia, and North-western Australia.

ALTHOUGH by no means the most common species, *Ephthianura aurifrons* is the most widely distributed member of the genus. Probably, like *E. tricolor*, it is in a measure nomadic in habits, and may occur one season in a district where it has not been observed before, and then be absent again for many years. In the Eastern Australian States it is strictly an inhabitant of the inland plains, and is never found near the coast. In South Australia it is not uncommon in the neighbourhood of Port Augusta; and in North-western Australia Mr. Tom Carter has noted it at Point Cloates, and Mr. G. A. Keartland at the junction of the Fitzroy and Margaret Rivers, some distance inland from Derby. I could find no record of its having been obtained in Northern Queensland until I received a skin for examination from Dr. W. Macgillivray, who informed me that it was common in the Cloncurry District, about two hundred miles south from Normanton, near the shore of the Gulf of Carpentaria. It is tolerably common in western New South Wales and the adjoining portion of South Australia, also in the central portions of the latter State, and I have seen specimens that were collected near the Murray River in northern Victoria.

There are numerous specimens in the Australian Museum Collection, obtained in the vicinity of Port Augusta, in South Australia, by Mr. K. Broadbent. Dr. A. M. Morgan informs me that to the north-west of this district, in July and August, 1900, he found small flocks frequenting salt-bush and samphire table-lands, but very wary and apparently not breeding, as none but old nests were found. Dr. Morgan has also observed it in the vicinity of Laura, about one hundred and forty miles north of Adelaide.

Like the adult males of *Ephthianura tricolor*, some specimens are much deeper in colour than others; the black feathers, too, in some examples extend from the throat well down on to the fore-neck. The richest coloured male in the Australian Museum Collection, probably a very old one, was procured by the late Mr. K. H. Bennett, who sent me the following notes:—"*Ephthianura aurifrons* is a constant resident in the Mossgiel District, New South Wales, and may be seen at all seasons, though it is much more numerous some years than others. It frequents the open plains, and may often be noticed perched on the top of a cotton or salt-bush, from which it flits off when disturbed by too near an approach, and alights on some other bush, or on the ground over which it trips with astonishing activity. It breeds in September and October as a rule, but I have found its nest containing eggs, as late as February."

From south-western New South Wales, Dr. W. Macgillivray writes me: "*Ephthianura aurifrons* was observed in this part of the State in 1901, a week before the arrival of *E. tricolor*, and I saw young birds flying on the 3rd November. Both species were noted during the hot dry summer months in private gardens in Broken Hill, and also more numerous in the Central Reserve, where a lot of manure provided an abundant feast of insects, etc., and which was resorted to, among other birds, by the three species of *Ephthianura* found in the district. *E. aurifrons* may often be noticed feeding on insects which congregate on flowering shrubs scattered over salt-bush flats. The stomachs of those shot during the spring contained mostly young grasshoppers. In 1903 they were seen on the 15th September, about a fortnight after

* Vict. Nat., Vol. xviii., p. 188 (1901).

the first rains since the spring of 1901, and soon became exceedingly numerous. During a trip which I took with Mr. J. R. Godfrey, on 9th November, 1903, to Horse Lake, about forty miles out on the Menindie track, the salt-bush flats bordering the road in places—veritable gardens of grasses and flowering herbage—contained thousands of both *Ephthianura aurifrons* and *E. tricolor*, rising in twos, and threes, and small family parties, from almost every bush for miles. They were then nesting, and many young birds were also flying about. Many nests containing fresh eggs were obtained late in December and early in January. The crops of those examined contained the remains of grasshoppers and other insects. Both species, *E. tricolor* and *E. aurifrons* differ from *E. albifrons*, in that they run more on the ground. They are very shy, and will not allow any one to approach them closely, running in and out between the salt-bush, and flying off when closely pressed. When young birds, or a nest containing young ones are approached, the parent birds will flap along the ground, and endeavour in the most approved plover fashion to lure one away from their little ones. The nests are usually built of fine grasses and rootlets, the finer material lining the egg cavity, and are placed in the top of a salt-bush."

Mr. G. A. Keartland writes me as follows:—" *Ephthianura aurifrons* is always most plentiful near rivers, lakes, or swamps. In Central Australia I found them in the vicinity of the Finke River, near Crown Point. They seem to be more sociable than *E. tricolor*, and are usually found in small flocks or pairs. Near Lake Way, Western Australia, these birds were numerous, and were very active in clinging to the twigs or grass-stalks standing in the water, or in running along the margins capturing insects. The birds were very tame, and permitted persons to approach close to them before taking flight. They were not observed in our journey across the desert, but they appeared about the swamps at the junction of the Fitzroy and Margaret Rivers, in North-western Australia, immediately after the tropical rains in February. Like all the genus, they build their nests close to the ground in any suitable low bush."

From North-western Australia, Mr. Tom Carter sends me the following note:—" *Ephthianura aurifrons* is a somewhat regular visitor to the coast, but only in limited numbers, being usually seen singly or in pairs. I have noted its occurrence at Point Cloates in January, February, March, April, July, August, and October, in various years. I have also seen it inland on salt-bush and samphire flats."

The nest is a neat open cup-shaped structure, externally formed of flowering plant-stalks, rootlets, and soft dried grasses, the inside being sparingly lined with very fine rootlets. An average nest measures three inches and a half in external diameter by two inches in depth, the inner cup measuring two inches and a quarter in diameter by one inch and a half in depth. It is built generally within a few inches of the ground in a low bush, and in western New South Wales frequently in a salt-bush or cotton-bush.

The eggs are usually three in number for a sitting, oval in form, the shell being close-grained, smooth, and slightly lustrous. They are pure white when blown, sprinkled over with dots and spots varying from very pale to dark purplish-red; some specimens have penumbral markings, others small irregular-shaped blotches, but as a rule in all they predominate on the thicker end. A set of three, taken at Mossgiel, New South Wales, in October, 1886, measures as follows:—Length (A) 0.67 × 0.48 inches; (B) 0.65 × 0.46 inches; (C) 0.7 × 0.49 inches. Another set, taken by Mr. C. E. Cowle at Crown Point, Finke River, Central Australia, in December, 1899, measures:—Length (A) 0.68 × 0.5 inches; (B) 0.67 × 0.52 inches; (C) 0.69 × 0.5 inches. Dr. A. Chenery sends me a note that after heavy rains in February, he obtained a set of eggs of this species, also one of *Ephthianura albifrons*, to the north-west of Port Augusta, South Australia, on the 22nd April, 1901.

Ephthianura crocea.

YELLOW-BREASTED NUN.

Ephthianura crocea, Castlenau & Ramsay, Proc. Linn. Soc. N.S.W., Vol. I., p. 380 (1877); Sharpe, Cat. Bds. Brit. Mus., Vol. VII, p. 669 (1883); Gould & Sharpe, Bds. New Guin., Vol. III., pl. 14 (1888); North, Proc. Linn. Soc. N.S.W., Vol. XXIII., p. 380 (1898); Sharpe, Hand-l. Bds., Vol. IV., p. 148 (1903).

ADULT MALE—General colour above brown slightly washed with olive, the feathers on the back with indistinct darker brown centres; lower back olive-yellow; rump and upper tail-coverts bright yellow; upper wing-coverts blackish-brown, the lesser coverts margined with yellow, the median and greater series with broad dull whitish margins which are again narrowly edged with yellow; primaries brown, their basal portion narrowly edged externally with yellow, which passes into ashy-white towards the tips; secondaries dark brown externally margined and tipped with ashy-white, their outer webs also narrowly edged with yellow; tail feathers dark brown, externally edged with yellow, paler at the tips, and having a white spot at the end of their inner web, the outermost feather pale brown, white at the base on the edge of the inner web; crown of the head olive-yellow; in front of the eye a small dusky-brown spot; ear-coverts yellow slightly tinged with olive; a line of feathers extending from the nostril over the eye bright yellow; sides of the neck olive-yellow; all the under surface bright yellow, deeper in tint on the chin and throat, which is followed on the fore-neck by a short crescentic band of black; the chest slightly tinged with olive, more distinct on the sides; under tail-coverts bright yellow; bill, legs, and feet (of skin) blackish-brown. Total length 4·3 inches, wing 2·3, tail 1·55, bill 1·42, tarsus 0·7.

ADULT FEMALE—Above ashy-brown, some of the feathers of the head and back with slightly darker centres; lower rump and upper tail-coverts yellow; wings and tail as in the male; lores and an indistinct line over the eye dull ashy-white; ear-coverts and sides of the neck pale ashy-brown; chin and throat dull white; fore-neck and upper breast pale ashy-brown, slightly darker on the sides of the body; remainder of the under surface dull white, washed with yellow; under tail-coverts yellow; bill (of skin) brown, lighter at the base of the lower mandible; legs and feet blackish-brown. Total length 4·25 inches, wing 2·3, tail 1·45, bill 0·42, tarsus 0·7.

Distribution.—Northern Queensland, North-western Australia.

IN addition to its smaller size and clearer and brighter yellow under parts, the adult male of the present species may be distinguished from that of *Ephthianura aurifrons*, which it more nearly resembles, by having the chin and throat rich yellow, and by having a black crescentic marking on the fore-neck. It was discovered by Mr. T. A. Gulliver, near the mouth of the Norman River, in the Gulf District, Northern Queensland. Subsequently it has been noted and obtained by several collectors, as well as its nests and eggs, near the Fitzroy River, in North-western Australia. Although doubtless its range extends over similar latitudes in the intervening Northern Territory of South Australia, up to the present time I know of no authenticated record of specimens being procured from that part of the continent.

The above descriptions are taken from a pair of birds obtained near Derby, North-western Australia. The male differs chiefly from Dr. Sharpe's figure and description of this species in the "Birds of New Guinea," in having the crown of the head only slightly washed with olive, the ear-coverts almost uniform in colour with the sides of the head; the chin and throat deeper yellow, and the remainder of the under surface, below the black crescentic band on the fore-neck, uniform bright yellow instead of yellow mixed with ashy. The female agrees fairly well in colour with the figure there given.

* Bds. New Guin., Vol. iii., pl. 14 (1888).

Mr. G. A. Kearnland writes me: "Whilst camped beside a lagoon, about four miles from the Fitzroy River, North-western Australia, and nearly opposite Noonkoombah Station, I saw a great many examples of *Ephtharura atrata*. Their brilliant yellow plumage and black head at once attracted attention, but their mode of life was very different from that of *E. atrata*. Whilst the latter delights in searching for its insect food amongst salt-bush or on the ground, *E. atrata* is more at home in the branches of trees, about fifteen to twenty feet high, where it hops about searching for insects either in the bark or on the surface. Occasionally they may be seen on the ground. They do not appear to associate in flocks, like any of the other species, but each works on its own account. Their nests are built in the usual cup-shaped form, and the one from which my set of eggs was taken was placed in a thistle about four feet high."

A nest of this species, taken from a low bush in December, 1887, near Derby, North-western Australia, is a small cup-shaped structure, irregularly formed externally of thin dried stalks of herbaceous plants, and lined inside with fine wiry grasses and rootlets.

The eggs are three in number for a sitting, oval in form, and pure white, with minute dots and spots of blackish-red sparingly distributed near the surface of the shell. A set of three measures:—Length (A) 0.60 × 0.43 inches; (B) 0.62 × 0.45 inches; (C) 0.62 × 0.44 inches. A set of three in Mr. G. A. Kearnland's collection, taken by Mr. E. J. Harris, has the markings confined almost entirely to the larger end, where they assume the form of fairly well defined zones:—Length (A) 0.67 × 0.52 inches; (B) 0.7 × 0.5 inches; (C) 0.66 × 0.51 inches.

Genus CALAMANTHUS, Gould.

Calamanthus fuliginosus.

STRIATED REED-LARK.

Anthus fuliginosus, Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 230 (1826).

Calamanthus fuliginosus, Gould, Bds. Austr., fol., Vol. III., pl. 70 (1848); *id.*, Handbk. Bds. Austr., Vol. I., p. 388 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 335 (1883); *id.*, Handl. Bds., Vol. IV., p. 25 (1903).

ADULT MALE—*General colour above greenish-olive, all the feathers centred with black, but with the streaks narrower and less distinct on the rump; upper wing-coverts blackish, margined with greenish-olive; quills blackish-brown, margined externally with greenish-olive, except the outer primaries, which are narrowly edged with ashy-white; tail feathers olive-brown, the central pair narrowly streaked with black along the shaft, which widens out in an elongated mark near the tip, the remainder crossed with a subterminal band of black except on the extreme edge of the outer web, and having a spot of pale ashy-brown at the end of their inner webs; forehead slightly washed with rufous; a line commencing behind the nostril orange-buff and gradually passing into pale yellowish-white as it extends over and behind the eye; lores dusky-brown; ear-coverts brown, with narrow fulvous shaft-lines; chin and throat white streaked with black; remainder of the under surface yellowish-buff streaked with black except on the centre of the lower breast and abdomen, which is of a uniform clearer buff; flanks and under tail-coverts yellowish-buff, streaked with black; bill dark brown, the lower mandible fleshy-brown, except near the tip; "iris light buff" (Atkinson). Total length in the flesh 5.8 inches, wing 2.45, tail 2.3, bill 0.5, tarsus 1.*

ADULT FEMALE—*Differs from the male in having the line extending from the nostril over the eye richer in colour; the chin and throat buff instead of white, and less distinctly streaked with black.*

Distribution.—Tasmania.

THE type of *Calamanthus fuliginosus* was described by Vigors and Horsfield in the "Transactions of the Linnean Society," who state "this bird was procured by Mr. Brown at Van Diemen's Land in 1804." Dr. R. B. Sharpe, in describing this species in the "Catalogue of Birds in the British Museum," records the type as being obtained in Australia, and enumerates five examples from South Australia, one in the Gould collection being obtained at Mount Gambier, near the border of south-western Victoria. Dr. A. M. Morgan and Mr. A. Zietz inform me that they have never met with it, or seen an example in any collection formed in South Australia. The above descriptions are taken from examples received in the flesh from Mr. E. D. Atkinson, and obtained by him at Waratah, at the foot of Mount Bischoff, in north-western Tasmania. These specimens, six in number, are all larger and darker than others procured by Mr. George Masters at the Ouse River, in March, 1867, and an adult male and female obtained by Dr. L. Holden at Bellenive, near Hobart, in May, 1904. Should Vigors and Horsfield's *Calamanthus fuliginosus* be founded on an Australian specimen, then I would propose the name of *Calamanthus diemenensis* for the birds described on the preceding page from Waratah, Tasmania.

Stomachs of specimens procured by Mr. E. D. Atkinson at Waratah on the 12th July, 1902, and received in the flesh by the Trustees of the Australian Museum, contained the remains of various insects, principally of water-beetles. In another were small fragments of an aquatic plant and a perfect specimen of a water-beetle. The walls of the stomachs of these birds are very thin.

From Dr. L. Holden's notes, I extract the following: "*Calamanthus fuliginosus* is common about Circular Head, on the north-west coast of Tasmania. It carries its tail high, jerks it backwards and forwards, and warbles cheerfully while perched on a spray or tussock. Game dogs point to it as to Quail; it runs before the dog as the Quail does, is difficult to flush, and drops again after a flight of a few yards. I found a nest from which I disturbed the bird, on the 31st October, 1886. It was built in a button-grass tussock among water, very closely concealed and difficult to find. The base, which rested on the ground and was quite damp, was made of moss and coarse grass, above that the structure was ball-shaped, and formed of fine dried grasses and was scantily lined with feathers of the Swamp Parrakeet (*Pezoporus ferox*), and contained three fresh eggs. On the 14th July, 1888, I found a nest containing three eggs, with well formed chickens in them. It was in dry ferny ground, and built in a clump of coarse grass and fern, and lined with dry grass, hare's fur, cow-hair, and Quail's feathers. The pointer stood the bird on the nest while we were out Quail shooting. Another nest I found on the 15th September, 1886, contained three young, just hatched."

The eggs are three in number for a sitting, oval or swollen-oval in form, some specimens are rather pointed at the smaller end, the shell being close-grained, smooth, and glossy. They vary from a pale chocolate-brown to faint purplish-brown, and typically have indistinct freckles and clouded markings of a slightly darker shade of the ground colour predominating at the thicker end, where they form in some specimens an indistinct cap or zone. Others are of a light reddish or pale purplish-brown, entirely free from markings, or may be of a slightly darker hue on the thicker end and gradually becoming lighter at the smaller end. A set of three, taken by Dr. L. Holden on Montagu Plain, near Circular Head, on the 31st October, 1886, measures as follows:—Length (A) 0.92 x 0.67 inches; (B) 0.95 x 0.67 inches; (C) 0.95 x 0.65 inches.

Mr. R. N. Atkinson found this species breeding at Waratah, in November. Mr. E. D. Atkinson sends me a note of his brother the Rev. H. D. Atkinson finding a nest with three eggs at Evandale, on the 24th December, 1890; another, with three eggs, on the 12th

* Trans. Linn. Soc., Vol. xv., p. 230 (1826).

† Cat. Bds. Brit. Mus., Vol. vii., p. 502 (1883).

September, 1893, at Circular Head; and a third, also with three eggs, at Longland, on the 17th November, 1896. From Dr. Holden's notes, and the dates just quoted, the breeding season of this species is shown to extend at least over the latter half of the year.

Calamanthus albiloris.

WHITE-LORED REED-LARK.

Calamanthus albiloris, North, Vict. Nat., Vol. XIX, p. 102 (1902); Sharpe, Hand-l. Bds., Vol. IV, p. 358 (1903).

ADULT MALE.—Like the adult male of *CALAMANTHUS FULIGINOSUS*, Vigors & Horsfield, but distinguished from that species in being smaller, paler, less distinctly streaked, and in having a white triangular-shaped patch in front of the eye joining a white superciliary line; ear-coverts dull rufous, indistinctly streaked with white; the quills are more distinctly edged with ashy-white, and the spot at the end of the inner webs of the lateral tail feathers is almost pure white. Total length 5.2 inches, wing 2.2, tail 2.1, bill 0.45, tarsus 0.9.

ADULT FEMALE.—Differs from the adult male in having the eye-brow less distinct; a spot behind the nostril, and the lores dull orange-rufous, and the throat buff but narrowly streaked with black like that of the male.

Distribution.—Victoria.

THE present species was described from a single specimen, forming part of the Old Collection of the Australian Museum, and nothing is known of its history beyond that given on the label:—"*Calamanthus fuliginosus*, Victoria, 1865." From that species it differs, as pointed out above, the type also having a line of white feathers below the eye. Since the description was sent to press, Mr. G. A. Kearland procured me another specimen obtained by him at Clayton, Victoria; and recently, on loan, an adult male and female procured by Mr. R. Hall at Altona Bay. Mr. Kearland and Mr. J. Gabriel observed this species at the Werribee River, and it is doubtless the same whose nests and eggs I procured in the vicinity of Melbourne in my early collecting days. One bird, killed at Albert Park with a catapult, I well remember had a spot of white at the tip of the inner webs of the outer tail feathers. As this agrees with the description of the tail feathers of *C. campestris*, and Dr. Sharpe records Victoria† as its habitat, I formerly attributed the nests and eggs I found to *C. campestris*, instead of the present species. Referrable also to *C. albiloris* is the single specimen recorded from New South Wales,‡ obtained by Mr. E. Payten on the 19th August, 1896, on Boloco Station, near Buckley's Crossing Place. It is a female, and lacks the characteristic triangular white patch in front of the eye as in the male. Except in the tail feathers, lighter colour, and being less distinctly streaked, it is barely distinguishable from the female of *C. fuliginosus*.

This bird has a pleasing song, which is usually poured forth when perched on the topmost twig of some low bush. It is generally sustained for a long time, unless interrupted by an intruder, when it immediately seeks cover below.

The nest is rounded in form, with a small entrance in the side, and is outwardly constructed of coarse grasses and weeds, the inside being lined with finer grasses and a thick lining of feathers, one or two frequently projecting from the entrance. An average nest measures externally four inches and a half in diameter, and across the entrance one inch and a quarter. They vary, however, in size and the materials with which they are outwardly formed: those I

* Vict. Nat., Vol. xix., p. 102 (1902).

† Cat. Bds. Brit. Mus., Vol. vii., p. 503 (1883).

‡ Rec. Aust. Mus., Vol. iii., p. 14, 1897.

found in grass tussocks in dry situations were formed entirely with dried grasses, lined with feathers. The site selected for the nest is varied, sometimes it is built on the ground, in or underneath a tuft of rank grass; but more often have I found it artfully concealed at the bottom of a low, stunted, thickly foliaged bush, growing in water or in wet and swampy ground at the mouth of the Yarra River. The bird at all times sits very close, and I discovered most nests by pulling the bushes open and flushing the birds. At Albert Park I used to find them sheltered underneath dried grass tussocks. On one occasion, when the nest was built in short coarse grass, just sufficient to conceal the structure, the bird allowed itself to be trampled upon before leaving its eggs, which were in an advanced state of incubation.

The eggs are usually three, in two instances I have found four in number for a sitting, oval in form, the shell being close-grained, smooth, and more or less chiselled. They vary from a light chocolate to faint purplish-brown, which is indistinctly mottled and speckled with a slightly darker shade of the ground colour, predominating as a rule on the thicker end, and sometimes forming there a clouded cap or zone. A set of three, taken at Albert Park, near Melbourne, during July, 1875, measures:—Length, A. 1.77; C. 1.58 in. (lost); B. 0.71; 0.69 inches; C. 0.58; 0.60 in. (lost). A set of three, taken on the 17th June, 1880, at the mouth of the Yarra River, measures:—Length, A. 1.81; C. 1.57 in. (lost); B. 0.78; 0.57 in. (lost); C. 0.58; 0.58 inches. The eggs of this species are distinctly smaller than those of *Calamanthus campestris*, as will be found on reference to Plate B, VII., where both are figured.

This species is, without exception, the first of all species to commence building in Victoria, starting before the winter has commenced, and rearing its young during the coldest months of the year. June and July are the principal months for obtaining eggs, and I have known them to be taken as early as the 24th May. At the mouth of the Yarra, near Melbourne, on the 17th June, 1880, I found four nests, each containing three fresh eggs.

Calamanthus campestris.

FIELD REED LARK

Praticola campestris, Gould, Proc. Zool. Soc., 1840, p. 171.

Calamanthus campestris, Gould, Bds. Austr., fol., Vol. III., pl. 71 (1848); *ibid.*, Handbk. Bds. Austr., Vol. I., p. 389 (1865); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 502 (1883); *ibid.*, Handl. Bds., Vol. IV., p. 25 (1903).

ADULT MALE—*General colour above ashy-brown, all the feathers streaked down the centre with dark brown, more broadly on the back; upper wing-coverts brown, the greater series dark brown in the centre; quills brown, externally edged with pale brown; upper tail-coverts rufous-brown; tail-feathers reddish-brown, crossed by a broad subterminal black band except on the central pair; the lateral feathers tipped with white on the inner webs, pale brown on the outer except near the shaft; forehead and snipeut light rufous, narrowly streaked with dark brown; lores, and a distinct eye-brow white; a spot in front of the eye rufous, ear-coverts light rufous with white shaft lines; cheeks and throat white; fore-neck narrowly streaked with dark brown; remainder of the under surface faint buffy-white, passing into buffy-brown on the sides of the body, and all distinctly streaked with dark brown except on the centre of the breast and the abdomen; under tail-coverts buffy-brown with whitish tips; bill light brown; legs and feet light brown; iris yellow* (Morgan).

ADULT FEMALE—*Differs from the male in having the cheeks and throat faint buffy-white instead of pure white, but is similarly streaked with dark brown.*

Distribution.—South Australia, North-western Australia.

THE Field Reed-Lark inhabits South Australia and the western portion of the continent, Gould describing the type from a specimen procured in the former State. The descriptions on the preceding page are taken from examples obtained by Mr. George Masters at Port Lincoln in November, 1865. Dr. A. M. Morgan and Dr. A. Chenery met with it during a trip made to the Gawler Ranges in August, 1902, but only one bird was shot—an adult male, near the Government Tank at Mount Ive. Mr. Tom Carter forwarded me a specimen for examination from Point Cloates, North-western Australia. It is precisely similar in colour and markings to those procured in South Australia. Subsequently Mr. Carter sent me the following note:—“*Calamanthus campestris*, is common on the coast here, but I have never met with it any distance inland. It is of skulking habits, and would not be noticed much but for its cheerful notes, which are usually uttered from the top of a thick shrub. It lays after any rain, winter or summer, and I have seen fledged young in July. The nest is snugly hid in thick undergrowth, and three or four eggs are laid for a sitting. Numbers of these birds haunt the cover formed by the ‘roley-poley’ growth being blown up against the paddock fences, and which is held there by grass growing through it, affording thereby a safe retreat for small birds.”

Mr. G. A. Keartland informs me that during the journey of the Calvert Exploring Expedition in Western Australia, this species was frequently met with in the samphire and salt-bush, in August, 1896. Several of their nests were found built beneath the latter kind of shrub, and two lying in exposed positions on the bare ground without any attempt at concealment on the part of the owners. The nests were globular in form, with an entrance in the side, being outwardly constructed with dried grasses, and lined inside with feathers. Mr. E. R. Morgan informs me that he found a nest with four eggs near Mount Gunson, South Australia, on the 31st July, 1899.

The eggs are three or four in number for a sitting, oval in form, the shell being close-grained, smooth, and lustrous. They are of a uniform pale chocolate except on the larger end, where they are of a slightly darker hue, forming in some specimens dull clouded caps, or indistinct zones. A set of three, taken near Port Lincoln, in South Australia, measures:—Length (A) 0.78×0.6 inches; (B) 0.81×0.62 inches; (C) 0.82×0.63 inches. The set of four taken by Mr. E. R. Morgan near Mount Gunson, South Australia, measures:—(A) 0.83×0.62 inches; (B) 0.8×0.62 inches; (C) 0.81×0.63 inches; (D) 0.85×0.63 inches.

Calamanthus isabellinus, of Central Australia, is a desert form of the present species. In addition to the more extended pale rufous colour of the head and uniform isabelline hue of the upper parts, on which the streaks are almost entirely lost, the bill is longer and straighter than in *C. campestris*. Their habits, too, are quite different, the former frequenting desolate gibber plains, and, as described by Mr. G. A. Keartland in his field-notes, “far away from scrub or shelter of any kind, two of these little birds were seen running over the stones or gibbers as actively and quickly as Dotterel on the sea-beach.”

* North—Rep. Horn Sci. Exped. Centr. Austr., Vol. ii., Zool., p. 85 (1896).

Genus POMATOSTOMUS. *Cabanis.**Pomatostomus temporalis.*

GREY-CROWNED CHATTERER.

Pomatorhinus temporalis, Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 330 (1826); Gould, Bds.

Austr., fol., Vol. IV., pl. 20 (1848); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 418 (1883);

id., Hand-l. Bds., Vol. IV., p. 14 (1903).

Pomatostomus temporalis, Gould, Handbk. Bds. Austr., Vol. I., p. 479 (1865).

ADULT MALE.—Centre of crown pale greyish brown, gradually becoming darker on the head-neck and passing into dark brown on the lower back and rump; lesser wing-coverts like the back, median and greater coverts dark brown, quills dark brown, the inner webs of the primaries rufous with blackish-brown tips, the latter increasing in size towards the outermost feather which has the inner web pale rufous only at the base; upper tail-coverts blackish-brown; tail-feathers blackish brown tipped with white, the outer webs of the outermost feathers almost black, and having large white tips; a broad stripe extending from the base of the nostril over the eye on to the sides of the nape white, the fore part slightly tinged with buff; lores blackish; ear-coverts ashy-brown, bordered above and below with a blackish streak; sides of the neck ashy-brown; cheeks, throat, and fore-neck white; breast dull rufous, whitish in the centre; flanks, abdomen, and thighs brown; under tail-coverts brown, with dark brown centres; bill blackish-brown, pale fleshy-grey along the basal portion of the lower mandible; legs and feet olive-black; iris straw-yellow. Total length in the flesh 11 inches, wing 4½, tail 5, bill 1½, tarsus 1½.

ADULT FEMALE.—Similar in plumage to the male, but slightly smaller.

Distribution.—Queensland, New South Wales, Victoria, South Australia.

THE genus *Pomatostomus* was formed by Dr. Cabanis, in 1850, for the reception of the Australian species until then included by various authors in the genus *Pomatorhinus*. As he there points out in his type, *P. temporalis*, the species inhabiting Australia have the wings of a different form, the third and fourth primaries being proportionately longer, and the tail rounded, the feathers of which are broader and tipped with white. The well-known Rabblers comprising the genus *Pomatorhinus* have an extensive range, with their stronghold in India, all of them having uniform-coloured tails, and most of them with conspicuously coloured bills varying from yellow and orange to coral-red and crimson. However seemingly trivial are the characters upon which the genus *Pomatostomus* was founded, there is a very marked and wide divergence in the mode of nidification and the eggs of the different species of this closely allied genus. Their large and conspicuous dome-shaped nests, externally formed of thin sticks and twigs, are usually built in trees, sometimes in bushes, but never on the ground; and their eggs, generally of a shade of brown, buff, or grey, are typically marbled or veined with a fine network of blackish or dark brown hair-lines, and are usually easily distinguishable from those belonging to any other Australian bird. The different species of *Pomatorhinus* form either cup or saucer-shaped, globular, or dome-shaped nests, constructed principally of leaves, rootlets, and grasses, and are built on or near the ground, in low scrub, under banks and rocks, among the tangled roots of trees, and occasionally in creepers, or between a piece of projecting bark and the trunk of a tree some little height from the ground. All species of this genus lay pure white eggs, some of them very glossy, and are in marked contrast to those belonging to the Australian genus *Pomatostomus*.

The present species, *Pomatostomus temporalis*, ranges over the greater portion of Eastern and South-eastern Australia. It is remarkable that in Queensland and Southern Victoria it is also found close to the coast, as well as inland, but in New South Wales, although abundantly

* Mus. Hein., Theil, i., p. 83 (1850).

distributed inland, it is never found near the coast in the south-eastern portion of that State. These birds frequent chiefly open forest-lands and pine scrubs, moving about in small flocks from four to seven or more in number, and are at all times exceedingly noisy and garrulous. They obtain their food principally on the ground, generally beneath wide-spreading trees, where, with puffed out body feathers and slightly spread wings, they may be seen running here and there over the grassy sward, disputing among themselves the possession of an insect or other dainty morsel, and keeping up at the same time an incessant chattering. When disturbed they fly on to the lower branches of a tree and hop from limb to limb, in a similar manner to *Struthidea cinerea*, which they resemble very much in their actions, until reaching the top, they leave the tree, sometimes only in twos and threes, following in a line one after the other. In the pine scrubs about Wellington and Dubbo I found these birds far less wary and more easy of approach than in the open forest-lands about the Namoi and Gwydir Rivers.

It is impossible to convey any accurate idea by words of the notes of this species. "Chatterer," by which name it is commonly known in many parts of New South Wales, more aptly describes them than any other; but its varied notes have also earned for it the name elsewhere of "Dog-bird," "Barking-bird," and "Cat-bird." From their sociable habits they are known about western New South Wales as the "Happy Family," and in some parts share

with *Struthidea cinerea* the name of "Twelve Apostles," the local names being frequently transposed for both species.



GREY-CROWNED CHATTERER.

The wings of adult males vary in length from 4.45 to 4.7 inches, and of adult females from 4.2 to 4.4 inches.

There is a beautiful albino of this species in the Australian Museum, obtained by Mr. C. Church near Lake Albert, New South Wales, in May, 1900.

I examined from Lake Cudgellico, obtained in August, contained the remains of beetles, mixed with a quantity of fine red sand and gravel.

The nest is a large dome-shaped structure, with a narrow spout-like entrance, which is generally difficult to discover when above one's head and attempting to insert a hand into it. Others have the entrance more or less concealed with an overhanging hood. It is outwardly formed of thin sticks and long twigs, slightly interwoven, and is lined generally with bark fibre, grasses, cow-dung, or wool, according to the locality in which it is built. The nests are variable in size, an average one measuring externally fourteen inches in height by twelve inches in breadth, and across the entrance two inches and a half. In open forest lands it is usually built near the extremity of a forked horizontal branch, where several thin leafy twigs sprout out, or in a bushy bough, generally of a *Eucalyptus*. Inland, the crown, or at the junction of several forked upright branches of the different species of *Callitris* and *Acacia*, are more often resorted to; and in the Upper Clarence District, the Native Quince (*Petalostigma quadriloculare*) and a species of *Melaleuca* are selected. The nests are usually built at a height varying from ten to twenty feet, and in some instances as high as forty feet. Between Gunnedah and Narrabri, the nests of this species form a prominent feature in the landscape, a great number of the trees

having one or more nests either perfect or in different stages of dilapidation. While at Copmanhurst, Mr. Clarence Savidge drew my attention to the fact that in many instances the limbs of trees which contained old nests were either bare of leaves or dead. I have had frequent opportunities of observing that several birds often assist in building a nest, and in the daytime have seen two and sometimes three birds leave one of these structures when apparently finished. By throwing a stick against the nests, just about dusk, it will be discovered, too, that one or more are resorted to by several birds as roosting places. Mr. George Savidge informed me that many nests are built without ever being laid in, and that one he had under observation near his house, the birds were engaged in its construction, or in making additions to it for a period of six weeks. Out of many nests examined, four I found was the average number of eggs laid for a sitting, sometimes only three, and on one occasion six, the latter undoubtedly laid by two birds, for they are of two very distinct types in shape and ground colour. I have, however, several sets of five eggs now before me, apparently each set laid by one bird. Mr. E. H. Lane, who has had over forty years experience of these birds on Wambangalang Station, near Dubbo, writes me: "Four or five is the usual number of eggs I have found in the nests of *Pomatostomus temporalis*, but the most I ever obtained in one nest was nine, eight being perfect and one broken. By their ground colour they appeared to have been laid by two birds. This set I took on the 16th October, 1890, on Wambangalang Station."

The eggs are extremely variable in size, shape, and colour. Typically they are elliptical or elongate-oval in form, ovals and slightly swollen-ovals are not uncommon, and specimens are sometimes found unusually elongate, and pointed at the smaller end, the shell being close-grained, smooth, and lustrous. The ground colour varies from pale brown to faint greyish and olive-brown, light sienna-brown, and purplish-brown and buff, which is as a rule distinctly mottled or veined with blackish or dark brown hair-lines wound latitudinally around the shell, but not infrequently in a zig-zag manner in various directions. In some places fainter blurred streaks take the place of the darker veins, forming smeared patches, and in rare instances specimens may be found with only indistinct mottlings or dull clouded markings on the larger end of a slightly darker shade of the ground colour. An average-sized set of four, taken at Wellington, New South Wales, in August, 1896, measures: Length (A) 1.13×0.78 inches; (B) 1.12×0.75 inches; (C) 1.15×0.77 inches; (D) 1.11×0.8 inches. A set of three, taken at Louth, New South Wales, on 20th August, 1887, measures: (A) 1×0.77 inches; (B) 1.03×0.78 inches; (C) 0.98×0.76 inches. Six eggs, taken from a nest at Western Port, Victoria, in September, 1887, two of which are distinctly zoned on the larger end with blackish-brown, measure: Length (A) 1.2×0.7 inches; (B) 1.2×0.7 inches; (C) 1.13×0.75 inches; (D) 1.1×0.7 inches; (E) 1.11×0.7 inches; (F) 1.1×0.72 inches.

The nest figured on Plate A. 8, is one I obtained at Copmanhurst, on the 9th November, 1898, and is reproduced from a photograph taken the same day by Mr. George Savidge.

With the exception of the late summer months, the breeding season extends throughout the year. During several visits to Western Port, Victoria, nests with eggs were obtained in September and November. At Wellington, New South Wales, I saw these birds building in August, although fresh eggs were taken during the early part of that month. At Narrabri and Moree I found young birds flying about in November, and some birds were then engaged in building, as they were also in the Upper Clarence District in the same month of the following year. Mr. George Savidge writes me: "*Pomatostomus temporalis* breeds about Copmanhurst at any time; I took eggs in April and May, 1900, and they were still laying in October."

After re-lining the inside or a depression in the top with bark, the Blue-faced Honey-eater (*Entomyza cyanotis*) usually deposits her eggs in the deserted nest of this species.

Pomatostomus rubeculus.

RUFIOUS-BREASTED CHATTERER.

Pomatorhinus rubeculus, Gould, Proc. Zool. Soc., 1839, p. 111; *id.*, Bds. Austr., fol., Vol. IV., pl. 21 (1848); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 421 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 14 (1903).

Pomatostomus rubeculus, Gould, Handbk. Bds. Austr., Vol. I., p. 481 (1865).

ADULT MALE.—Centre of crown and hind-neck dark greyish-brown, gradually passing into blackish-brown on the lower back and rump; wings rich brown, the inner webs of the primaries pale rufous with brown tips; upper tail-coverts black; tail feathers black, tipped with white more largely on the outermost feathers; a broad band extending from the nostril over the eye and on to the sides of the nape dull white with a slight creamy tinge; lores and feathers below the eye blackish; ear-coverts dark brown; sides of the neck brown, with an ashy shade; cheeks and throat white, passing into dull rusty-rufous on the fore-neck and breast, and rufous-brown on the abdomen; under tail-coverts blackish. Total length 9 inches, wing 4, tail 4, bill 1, tarsus 1.5.

ADULT FEMALE.—Similar in plumage to the male.

Distribution.—North-western Australia, Northern Territory of South Australia, Central Australia.

THE type of this species was described by Gould from a specimen obtained by the late Mr. B. Bynoe during the stay of H.M.S. "Beagle" on the north-western coast of Australia. I have a series of skins now before me, comprising specimens collected by the late Mr. T. H. Bowyer-Bower at Derby, North-western Australia; by Mr. Alexander Morton at Port Darwin and Port Essington, in the Northern Territory of South Australia; an unlocalized specimen obtained during Mr. J. McD. Stuart's transcontinental expedition in 1862; and another procured in Central Australia. In only one specimen, from Derby, does the centre of the crown of the head and the hind-neck show no trace of the ashy-grey or greyish-brown wash, like that of *Pomatostomus temporalis*, but it is apparent to a certain extent in all the specimens from Port Darwin and Port Essington; also in Gould's figure of this species.* Moreover, examples from Port Darwin and Port Essington are slightly larger, the lower throat is white with a rufous wash, and the fore-neck and breast are much paler than in examples from North-western Australia, and in one specimen the upper back is entirely ashy-brown.

In the "Catalogue of Birds in the British Museum," Dr. Sharpe† gives the wing-measurement of this species as 3.7 inches. The specimens in the Australian Museum Collection vary in wing-measurement from 4 to 4.25 inches. The smaller measurement is that of an adult male from Derby, and agrees with that given by Gould of the type. As a rule the wing-measurement of adult specimens of the Australian species of this genus will be found to be slightly under the measurement of the tail. As with *P. temporalis*, some specimens have a more or less distinct creamy wash on the sides of the crown; in others it is almost pure white.

Mr. Tom Carter writes me from Point Cloates, North-western Australia:—"I have only met with *Pomatostomus rubeculus* on the Minilya River, about ninety miles south from here, when I discovered a number of their nests about twenty to thirty feet from the ground in a large white gum tree."

Mr. G. A. Keartland also sends me the following note:—" *Pomatostomus rubeculus* is found throughout Central and North-western Australia. It is a very sociable species, being generally met with in flocks from six to twelve. When moving from tree to tree, one bird would start

* Bds. Austr., fol., Vol. iv., pl. 21 (1848).

† Cat. Bds. Brit. Mus., Vol. iv., p. 421 (1883).

and before it reached its destination another would follow, and so a regular procession was kept up. The birds always alight near the base of the tree, and then proceed by a succession of jumps to the topmost branches. At Henbury, on the Finke River, Central Australia, I saw four of these birds working at one nest. Whilst three carried the material, the fourth placed it in position. Their huge dome-shaped nests, formed of sticks and twigs, and indistinguishable from those of *P. superciliosus*, were found with fresh eggs on the Cue Road in June, and also later on, at the Fitzroy River, North-western Australia, in January and February, 1897. As many as nine nests were found within a radius of one hundred yards. In addition to a variety of other noises, these birds often mew like a cat, hence the name 'Cat-bird' is often given them in the north."

The eggs are usually three in number for a sitting, and cannot be distinguished in colour from those of its larger congener *P. temporalis*. In fact the eggs of all species of the genus are so similar in form, in their varying shades of ground colour, and in the characteristic darker hair-lines that the description of the different varieties of one species would be almost applicable to all. Typically the eggs of *P. temporalis* are the largest, but small eggs of this species are indistinguishable from those of *P. rubiculus* and *P. ruficeps*. In average size those of *P. superciliosus* are the smallest.

The eggs of *Pomatostomus rubiculus*, are oval in form, the shell being close-grained, smooth, and slightly lustrous. They are of a faint purplish-grey ground colour, with an open net-work of fine hair-lines and broad blurred smears of dark brown distributed over the surface of the shell: Length (A) 1.07 × 0.72 inches; (B) 1.07 × 0.72 inches; (C) 1.07 × 0.73 inches. An egg taken by the late Mr. T. H. Bowyer-Bower, near Derby in 1886, is of a pale brown ground colour, indistinctly mottled with greyish brown, and devoid of the usual streaky hair-lines of darker brown, except one at either end of the egg: Length 0.99 × 0.69 inches. Three eggs, taken at Port Darwin, are of a pale sienna-brown ground colour, and distinctly marked or veined with blackish-brown: Length (A) 1 × 0.7 inches; (B) 1.02 × 0.72 inches; (C) 1.01 × 0.73 inches.

Pomatostomus superciliosus.

WHITE-EYEBROWED CHATTERER.

Pomatostomus superciliosus, Vig. & Horsf., Trans. Linn. Soc., Vol. XV., p. 330 (1826); Gould, Bds. Austr., fol., Vol. IV., pl. 22 (1848); Sharpe, Cat. Bds. Brit. Mus., Vol. VII, p. 419 (1883); *id.*, Hand-l. Bds., Vol. IV., p. 14 (1903).

Pomatostomus superciliosus, Gould, Handbk. Bds. Austr., Vol. I., p. 482 (1865).

ADULT MALE—*General colour above dull ashy-brown; wings brown, the quills externally edged with paler brown; tail dark brown, the lateral feathers broadly tipped with white; crown of the head dull ashy-brown; a broad line extending from the nostril on to the sides of the hind-neck white, bordered above and below with a narrow line of dusky brown feathers; lores dusky brown; ear-coverts dark silky-brown; cheeks, throat, and centre of the breast white, the latter slightly washed with brown; sides of the body, abdomen, and thighs fulvous-brown; under tail-coverts dark brown; all blackish-brown, fleshy-grey at the base of the lower mandible; legs and feet blackish-brown; iris steely-yellow. Total length in the flesh 8 inches, wing 3.3, tail 3.4, bill 1, tarsus 1.*

ADULT FEMALE—*Similar in plumage to the male.*

Distribution. Queensland, New South Wales, Victoria, South Australia, Central Australia, Western Australia, North-western Australia.

ALTHOUGH the range of this species extends over the greater portion of Australia, it appears to be far more abundantly distributed over the southern than the northern half of the continent. I have never seen specimens in any collection from the Northern Territory of South Australia, or the extreme northern portions of Queensland. Dr. E. P. Ramsay has recorded it in a collection of birds made at the mouth of the Norman River; neither Dr. W. Macgillivray nor his brother, Mr. A. S. Macgillivray, have observed it in the Cloncurry District, which is about two hundred miles south of the shores of the Gulf of Carpentaria. It is not uncommon in some parts of south-western Queensland, and it occurs in favourable situations throughout western and central New South Wales, north-western Victoria, South Australia, and Western Australia. In the latter State, Mr. George Masters obtained specimens at Salt River. Mr. Edwin Ashby found it common at Callion, and Mr. Tom Carter informs me that he has observed it in the neighbourhood of the Gascoyne River as far north as the North-west Cape. Mr. G. A. Kearland noted it breeding near Cue in June, 1896, and again at the Fitzroy and Margaret Rivers, in North-western Australia, in February, 1897. It is remarkable that neither of the large collections made by Mr. E. J. Curn and the late Mr. T. H. Bowyer-Bower, in the neighbourhood of Derby, contained an example of this species.

The wing-measurement of adults varies in length from 3 to 3·4 inches. Some specimens, probably very old birds, from Ivanhoe and Dubbo, New South Wales, have the feathers on the crown of the head distinctly darker than those on the back; the ear-coverts and central tail feathers, too, are darker than in specimens procured by Mr. Masters at Port Lincoln in South Australia.

In New South Wales it is more abundantly distributed in the western and central portions of the State, its range extending eastwards on to the Dividing Range, but it is never seen in the coastal districts. On the Bell and Macquarie Rivers, in August, 1887, in company with Dr. Ramsay, we observed these birds busily engaged in forming their large stick and twig nests, both in pines and gums, but it was far less numerous than its congener, *Pomatostomus temporalis*. I found the latter species common on the Namoi and Gwydir Rivers, in north-western New South Wales, but I did not meet with *P. superciliosus*, although Gould observed it further south on the Liverpool Plains. At Wattagoona Station, near Louth, on the Darling River, Mr. Edward Lord Ramsay found it breeding in 1890, chiefly in leopard and box-trees, and obtained fresh eggs from the 3rd August to the 14th October.

From Broken Hill, in south-western New South Wales, Dr. W. Macgillivray writes me: "*Pomatostomus superciliosus* is abundant along all the creeks in this district. Their nests are common amongst the prickly acacia bushes which grow in clumps in some places near the creeks. I first noted a nest with fresh eggs on the 9th June, 1901, and, on the 23rd, took two eggs, and fourteen days later, three more from the same nest. Eggs were fairly common throughout July and August, but most young birds had flown before the end of October."

Dr. A. M. Morgan, who made a trip with Dr. A. Chenery to Arcoona, about one hundred and forty miles to the north-west of Port Augusta, in July and August, 1900, writes me: - "*Pomatostomus superciliosus* was very common, and hundreds of nests were observed in all stages of erection and decay. At Mount Gunson, on the 29th July we examined two nests built in mulga, each of which contained three fresh eggs; also another, built in the brush wall of an outhouse, in which one egg had been deposited. The following day we found another with two fresh eggs, and on the 6th August one with three incubated eggs. On the 10th August, at Elizabeth Creek, we examined several nests, all of which contained eggs in various stages of incubation; also another at Yultacowie Creek the following day with three incubated eggs. In all the nests we examined never more than three eggs were found in one nest. The old structures were taken possession of by *Collyriocincla harmonica*, *Oreocera cristata*, and *Artamus cinereus*, as a base for their nests." Again, Dr. Morgan writing of their trip to the Gawler

Ranges in August, 1902, remarks: "*Pomatostomus superciliosus* was common wherever there was a vestige of timber. Almost every tree, large or small, contained portions of an old nest. We saw *Xerophila leucopsis* searching them for fur, and also found *Malurus leucopterus* and *Tamiepygia castanotis* using the nests as roosting-places. A few nests were found being built, but we did not get any with eggs."

The nest is a dome-shaped structure, with a spout-like entrance, similar to that of its congener, *Pomatostomus temporalis*, but smaller. Externally it is formed of long thin sticks and twigs, and is lined inside at the bottom of the domed portion with bark fibre, cow-dung, wool, fur, or dried grasses, according to the locality in which it is built. In central and western New South Wales the crown of a pine, acacia, or gum, is a favourite nesting-site, also the bushy sides of horizontal branches, about fifteen or twenty feet from the ground; but, as will be seen by Dr. Macgillivray's note, he has found it breeding in bushes. An average nest measures externally ten inches in diameter by eleven inches in height, and across the entrance two inches.

The eggs are usually three in number for a sitting, oval in form, the shell being close-grained, smooth, and lustrous. Pale greyish-brown is the predominating ground colour, but it varies to whitish-brown and buffy-brown. Some are slightly marked or veined with blackish-brown, but less so as a rule than those of any other species; others have indistinct mottlings of a darker shade of the ground colour, or a combination of hair-lines and almost obsolete spots, and some are entirely devoid of markings. A set of three, taken at Dubbo, New South Wales, measures: (A) 0.93×0.67 inches; (B) 0.91×0.65 inches; (C) 0.9×0.65 inches. A set of four, taken near Louth, measures: (A) 0.97×0.7 inches; (B) 0.93×0.67 inches; (C) 1×0.67 inches; (D) 0.97×0.67 inches.

Relative to the number of eggs laid by this species for a sitting, Mr. E. H. Lane writes me as follows:—"From my experience, three eggs is the usual number laid by *Pomatostomus superciliosus* for a sitting, although on one occasion I found five eggs in a nest. By the difference in their ground colour, however, they were evidently laid by two birds."

From the middle of May until the end of November constitutes the usual breeding season of this species in Eastern Australia.

Pomatostomus ruficeps.

CHESTNUT-CROWNED CHATTERER.

Pomatostomus ruficeps, Hartl., Journ. für Orn., 1853, p. 24; Gould, Bds. Austr., Suppl., pl. 38 (1869); Sharpe, Cat. Bds. Brit. Mus., Vol. VII., p. 420 (1883); *id.*, Handl. Bds. Vol. IV., p. 14 (1903).

Pomatostomus ruficeps, Gould, Handbk. Bds. Austr., Vol. I., p. 181 (1865).

ADULT MALE—General colour above ashy-grey, most of the feathers on the back having dark brown centres; rump and upper tail-coverts clear ashy-grey; lesser wing-coverts like the back, the median and greater series dark brown, tipped with white; quills brown, becoming darker on the innermost secondaries which are tipped with white, the primaries externally edged with pale brown; the central pair of tail feathers dark brown, the remainder blackish-brown tipped with white more broadly on the outermost feathers; crown of the head and nape chestnut; a broad line extending from the nostril over the eye on to the sides of the nape white, bordered on either side with a narrow line of black; lores blackish-brown; ear-coverts silky-brown, blackish at the base, as are also the feathers below the eye; cheeks, throat, and centre of the breast white, bordered with a narrow line of black, which widens out on the sides of the fore-neck; sides of the body ashy-brown, some of the

feathers having indistinct dull rufous margins; under tail-coverts dark ashy-brown, largely tipped with white; bill blackish; under surface of lower mandible horn colour; legs and feet black. Total length 8·5 inches, wing 3·45, tail 3·6, bill 1, tarsus 1·15.

ADULT FEMALE—*Similar in plumage to the male.*

Distribution.—New South Wales, Victoria, South Australia.

THE range of this species extends throughout the eastern portions of South Australia, north-western Victoria, and the greater portion of western New South Wales. In June, 1897, Mr. Robt. Grant obtained some very fine examples while collecting on behalf of the Trustees of the Australian Museum, on Buckinguy Station, in western New South Wales. Although resembling the other species in habits, Mr. Grant informs me that they are remarkably active on the ground, and difficult to procure, running with great rapidity, and as a rule, generally managing to get a bush, or other object, between themselves and any one following them.

From western New South Wales, the late Mr. K. H. Bennett, who presented specimens of these birds to the Trustees of the Australian Museum, wrote as follows:—“*Pomatostomus ruficeps* is plentifully distributed over the whole of the level timbered country to the north of Ivanhoe. It is met with in flocks of from six or eight to twenty individuals, and in habits and mode of nidification much resembles the other members of the genus; it is, however, far less garrulous and more shy in disposition. I am inclined to think that more than one bird lays in the same nest, for I have seen no less than five birds busily engaged in the construction of one at the same time, and have found as many as eight eggs in one nest.”

Mr. James Ramsay found this species breeding at Tyndarie, in September, 1876, and two nests examined each contained two eggs for a sitting.

The nest is a large dome-shaped structure, with a spout-like entrance, formed externally of long thin twigs, and lined inside with dried grasses, cow-dung, or wool. One taken in western New South Wales, averages thirteen and a half inches in height by eight inches and a half in breadth, and across the entrance two inches. It was built in the topmost branches of a pine, at a height of twenty feet from the ground.

Mr. G. A. Kearland writes me:—“*Pomatostomus ruficeps* is precisely similar to the rest of the genus in its general habits, with the exception that it passes most of its time on the ground. It is extremely active, and whilst hopping about keeps up a constant chatter. It is frequently seen in company with *P. temporalis*, but prefers thick scrub and rocky gullies to the open forest. Along the banks of the deep creeks at Melton, Victoria, they are very common, and as evidence that they are early breeders, I caught a young bird, scarcely able to fly, on 7th August, 1898. I have had specimens sent from Murtoa.”

The eggs are usually four, sometimes five in number for a sitting, oval, elongate-oval, or swollen-oval in form, the shell being close-grained, smooth, and lustrous. They vary in ground colour from light brown to purplish and umber-brown, and from faint ashy-green to olive-grey, some being marked or veined with hair-lines and blurred streaks of blackish-brown, others are indistinctly mottled with a darker shade of the ground colour, particularly on the larger end, and having here and there a streak or hair-line of dusky or blackish-brown. One specimen, which is represented on Plate B VII., figure 15, is distinctly spotted with dark brown on the larger end, in addition to having the common linear markings. A set of three, taken in South Australia, in September, 1882, measures:—Length (A) 0·99 × 0·7 inches; (B) 0·98 × 0·72 inches; (C) 0·98 × 0·72 inches. A set of four, taken in the Mossgiel District, New South Wales, in August, 1885, measures:—(A) 0·95 × 0·73 inches; (B) 0·95 × 0·75 inches; (C) 0·98 × 0·72 inches; (D) 0·96 × 0·7 inches. Like all the species of this genus, two or more birds sometimes lay in the same nest.

Young birds resemble the adults, but have the upper parts brown, indistinctly margined with pale rufous; upper tail-coverts dark brown, more conspicuously tipped with rufous; wings paler brown than in the adult, the white tips to the wing-coverts and inner secondaries also washed with rufous; crown of the head and nape dull chestnut; the broad white eye-brow washed with chestnut; ear-coverts brown, streaked with white; sides of the neck ashy-brown, some of the feathers with blackish centres; cheeks, throat, and centre of the body white, slightly tinged with rufous, more distinctly on the centre of the breast; sides of the breast rufous; abdomen dull white with ashy-brown centres; under tail-coverts ashy-brown, tipped with white which is slightly washed with rufous.

July and the five following months constitute the usual breeding season of this species.

EXPLANATION OF PLATE A. 5.

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Nest of *MALURUS MELANOCEPHALUS*.
Scarlet-backed Superb Warbler



EXPLANATION OF PLATE A. 6

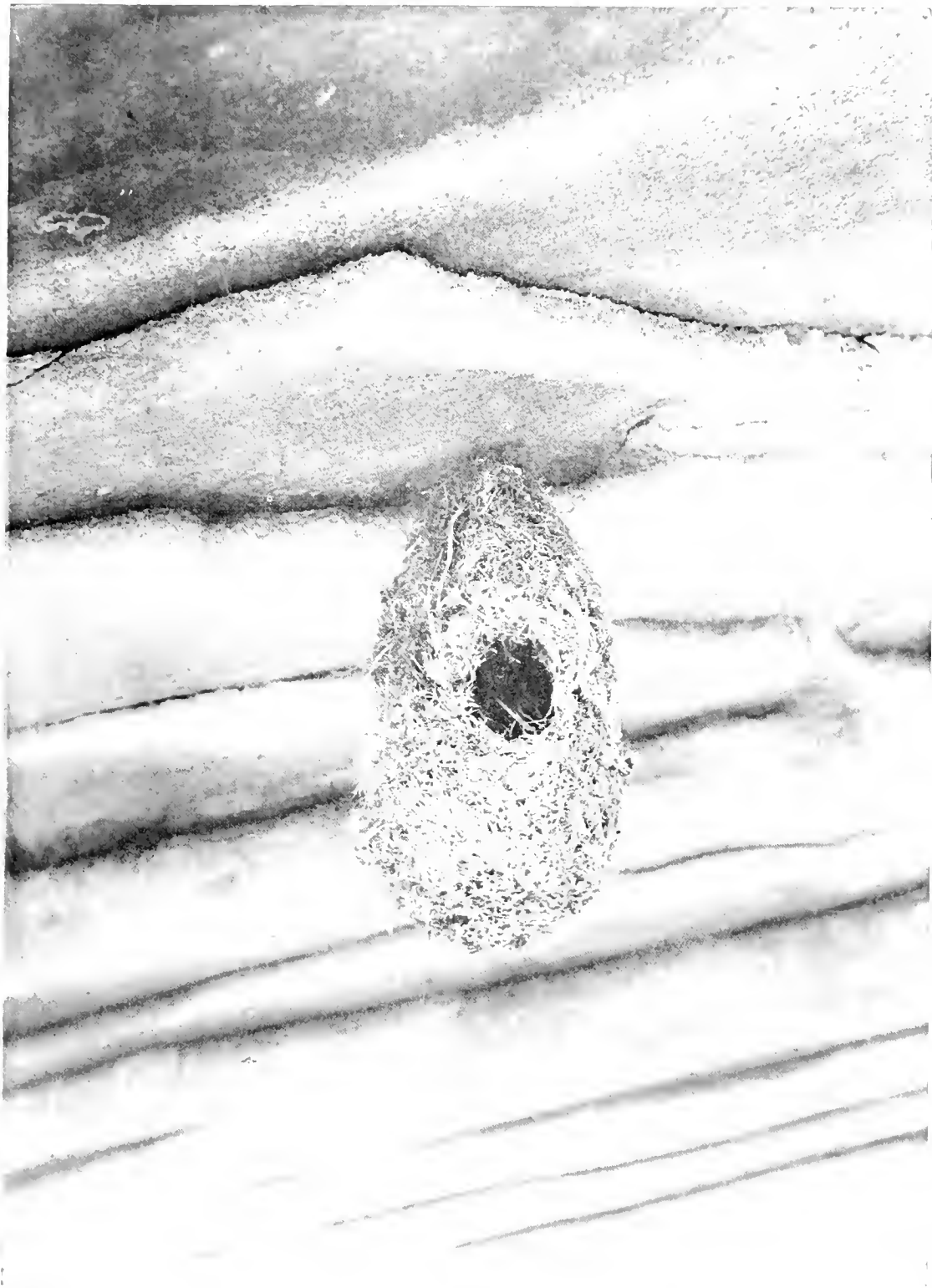
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Nest of ACANTHIZA POSILLA.
Scrub Thornhill.



EXPLANATION OF PLATE A 7.

Nest of *ORIGMA RUBRA* A.
Rock Warbler.



EXPLANATION OF PLATE A. 8.

Nest of POMAROSTOMUS TEMPORALIS
Grey-crowned Chatterer.



EXPLANATION OF PLATE B. V.

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- Fig. 1. *CINCLOSOMA CINNAMOMUM*.
Cinnamon-coloured Ground-Thrush.
- Figs. 2, 3. *HELIORHYNCHUS CINEREUS*.
Ashy-fronted Robin.
- Fig. 4. *DRYODICUS TENNILEGUS*.
Scribb Robin.
- Fig. 5. *SPHINCEA LONGIROSTRIS*.
Long-billed Bristle-bird.
- Figs. 6, 7. *TURNIX GYALUS*.
Black-backed Bustard-Quail.
- Figs. 8, 9. *TURNIX ALEXANDER*.
Swamp-birding Bustard-Quail.
- Fig. 10. *PACHYCEPHALA GUTTURATA*.
White-throated Thickhead.
- Fig. 11. *PACHYCEPHALA LEUCOMELAS*.
Rufous-breasted Thickhead.
- Fig. 12. *PACHYCEPHALA CALCATA*.
Lined Thickhead.
- Figs. 13, 14. *CLIMACTERIS PHOENIX*.
Brown Tree Creeper.
- Fig. 15. *CLIMACTERIS ERYTHROPS*.
Red-eyebrowed Tree Creeper.
- Fig. 16. *CLIMACTERIS SUPERCILIOSA*.
White-eyebrowed Tree-Creeper.
- Figs. 17, 18. *CINCLOERAPHUS RUFESCENS*.
Rufous-rumped Singing Lark.
- Figs. 19, 20. *ARTAMUS SUPERCILIOSUS*.
White-eyebrowed Wood-Swallow.
- Fig. 21. *ARTAMUS PERSONATUS*.
Masked Wood-Swallow.
- Fig. 22. *EOPSALTRIA CHRYSORRHOS*.
Golden-rumped Robin.
- Figs. 23, 24, 25. *EOPSALTRIA AUSTRALIS*.
Yellow-breasted Robin.
- Figs. 26, 27. *EOPSALTRIA CAPTO*.
Large-headed Robin.
- Fig. 28. *PECELODORYS SUPERCILIOSA*.
White-eyebrowed Robin.
- Figs. 29, 30. *LALAGE TRICOLOR*.
White-shouldered Caterpillar-eater.
- Fig. 31. *ANTHUS AUSTRALIS*.
Australian Pipit.
- Fig. 32. *ACROCEPHALUS AUSTRALIS*.
Reed-Warbler.
- Figs. 33, 34. *MICRÆCA FASCINANS*.
Brown Flycatcher.
- Fig. 35. *MICRÆCA PALLIDA*.
Pallid Flycatcher.
- Fig. 36. *MIRAFRA HORSFIELDII*.
Horsfield's Bush-Lark.



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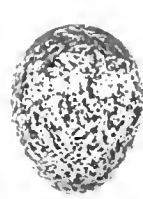
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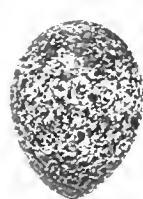
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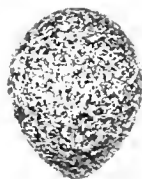
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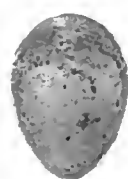
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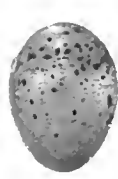
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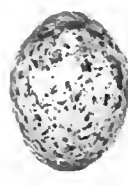
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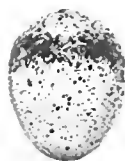
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EXPLANATION OF PLATE B. VI.

- Fig. 1. *C. ...* W. ...
- Fig. 2. *P. ...* H. ...
- Fig. 3. *P. ...* H. ...
- Fig. 4. *P. ...* H. ...
- Fig. 5. *P. ...* H. ...
- Fig. 6. *P. ...* H. ...
- Fig. 7. *P. ...* H. ...
- Fig. 8. *P. ...* H. ...
- Fig. 9. *P. ...* H. ...
- Fig. 10. *P. ...* H. ...
- Fig. 11. *P. ...* H. ...
- Fig. 12. *P. ...* H. ...
- Fig. 13. *P. ...* H. ...
- Fig. 14. *P. ...* H. ...
- Fig. 15. *P. ...* H. ...
- Fig. 16. *P. ...* H. ...
- Fig. 17. *P. ...* H. ...
- Fig. 18. *P. ...* H. ...
- Fig. 19. *P. ...* H. ...
- Fig. 20. *P. ...* H. ...
- Fig. 21. *P. ...* H. ...
- Fig. 22. *P. ...* H. ...
- Fig. 23. *P. ...* H. ...
- Fig. 24. *P. ...* H. ...
- Fig. 25. *P. ...* H. ...
- Fig. 26. *P. ...* H. ...
- Fig. 27. *P. ...* H. ...
- Fig. 28. *P. ...* H. ...
- Fig. 29. *P. ...* H. ...
- Fig. 30. *P. ...* H. ...
- Fig. 31. *P. ...* H. ...
- Fig. 32. *P. ...* H. ...
- Fig. 33. *P. ...* H. ...
- Fig. 34. *P. ...* H. ...
- Fig. 35. *P. ...* H. ...
- Fig. 36. *P. ...* H. ...



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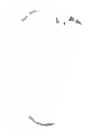
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EXPLANATION OF PLATE B. VII.

- Figs. 1, 2. *HYDRALLOPS GALLIACEUS*.
Lark-bird.
- Figs. 3, 4. *POREZANA PALUSTRIS*.
Little Water Cuckoo.
- Figs. 5, 6. *EXCALPATORIA LINPADI*.
King Quail.
- Figs. 7, 8. *PTENOPHILUS LEOCOSTUS*.
Pigeon-bird.
- Figs. 9, 10, 11. *SERICORNIS CITRIFRONS*.
Yellow-throated Scrub-Wren.
- Fig. 12. *POMATOSTOMUS INFUSCATUS*.
Rufous-breasted Chatterer.
- Figs. 13, 14. *POMATOSTOMUS GRACIOSUS*.
Grey-crowned Chatterer.
- Figs. 15, 16. *POMATOSTOMUS LUTULEUS*.
Chestnut-crowned Chatterer.
- Figs. 17, 18. *POMATOSTOMUS SUPERBIOIDES*.
White-eyebrowed Chatterer.
- Figs. 19, 20. *AMAURODRYAS VITIATA*.
Dusky Robin.
- Figs. 21, 22, 23, 24. *MELANODRYAS HOODED*.
Hooded Robin.
- Figs. 25. *CALAMANTHUS FULIGINOSUS*.
Striated Reed Lark.
- Figs. 26. *CALAMANTHUS ALBICOLLIS*.
White-throated Reed Lark.
- Figs. 27, 28. *SERICORNIS HUMILIS*.
Sombre Scrub-Wren.
- Figs. 29, 30. *SERICORNIS FRONTALIS*.
White-fronted Scrub-Wren.
- Fig. 31. *MISOCALUS PALLIOLATUS*.
Black-eared Cuckoo.
- Figs. 32, 33. *PYRRHOLEMUS RUBRIFRONS*.
Red Throat.
- Figs. 34, 35. *CHTHONICOLA SAGITTATA*.
Streaked Warbler.
- Fig. 36. *LAMPROCOCCYX PLAGIOSUS*.
Bronze Cuckoo.



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NESTS AND EGGS OF BIRDS

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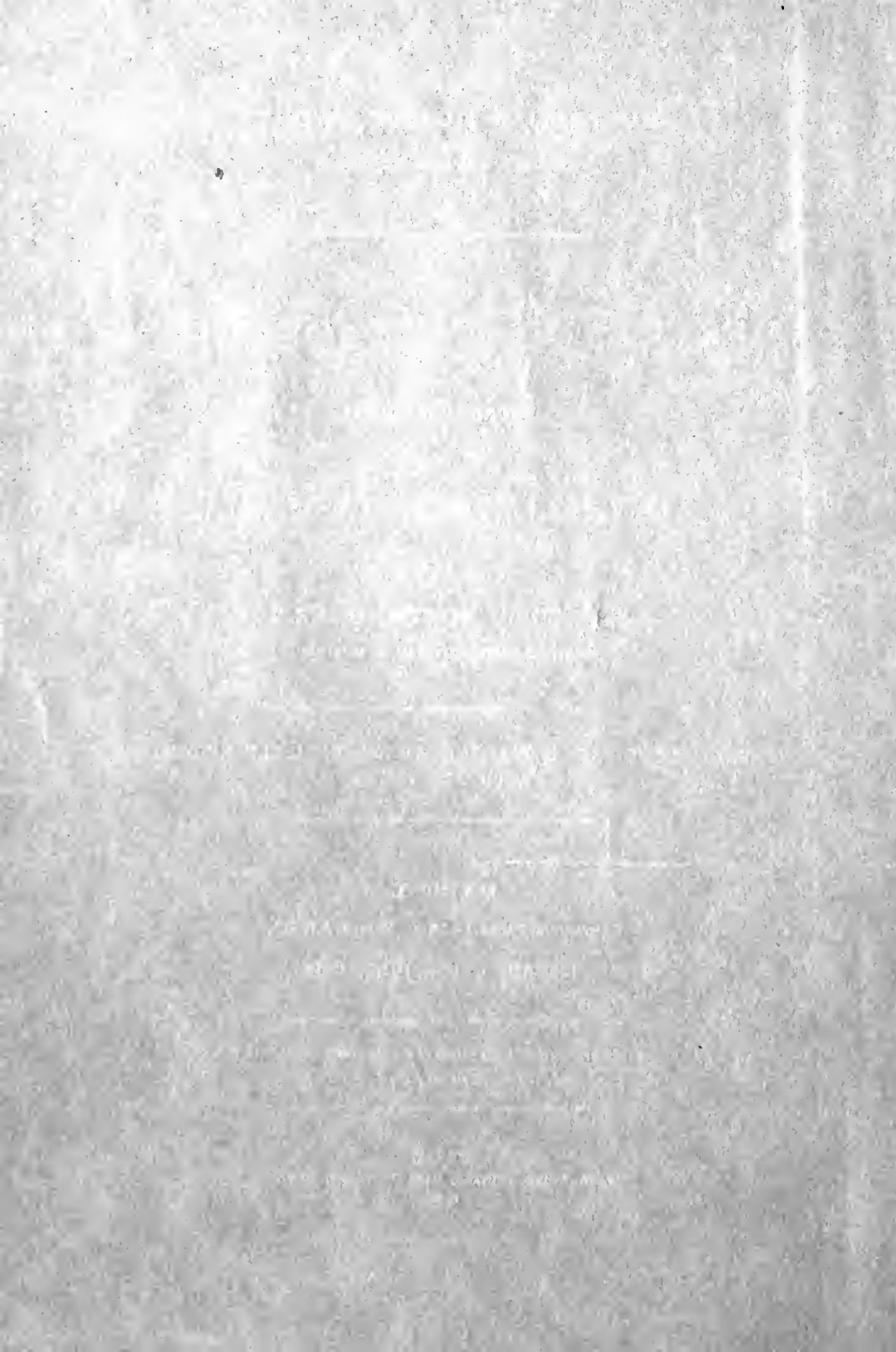
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